SDMS US EPA Region V

Imagery Insert Form

Document ID: 167830

Some images in this document may be illegible or unavailable in SDMS. Please see reason(s) indicated below:

[X] Illegible due to bad source documents. Image(s) in SDMS is equivalent to hard copy.

Specify Type of Document(s) / Comments:

P.46 OF DECLARATION-SELECTED REMEDIAL ALTERNATIVE

[ ] Includes _____ COLOR or ____ RESOLUTION variations.
Unless otherwise noted, these pages are available in monochrome. The source document page(s) is more legible than the images. The original document is available for viewing at the Superfund Records Center.

Specify Type of Document(s) / Comments:

[ ] Confidential Business Information (CBI).
This document contains highly sensitive information. Due to confidentiality, materials with such information are not available in SDMS. You may contact the EPA Superfund Records Manager if you wish to view this document.

Specify Type of Document(s) / Comments:

[ ] Unscannable Material:
Oversized _____ or _____ Format.
Due to certain scanning equipment capability limitations, the document page(s) is not available in SDMS. The original document is available for viewing at the Superfund Records center.

Specify Type of Document(s) / Comments:

[ ] Document is available at the Records Center .

Specify Type of Document(s) / Comments:

Rev. 07/10/02

1607830 E.5

STATE OF MICHIGAN

JOHN ENGLER, Governor

DEPARTMENT OF ENVIRONMENTAL QUALITY

HOLLISTER BUILDING PO BOX 30473 LANSING MI 48909-7973

INTERNET http://www.deq.state.mi.us

RUSSELL J. HARDING, Director

REPLY TO

ENVIRONMENTAL RESPONSE DIVISION
KNAPPS CENTRE
PO BOX 30426
LANSING MI 48909-7926

June 26, 2000

Saugatuck-Douglas Library
Reference Desk
10 Mixer St.
Douglas, Michigan 49406

Subject: Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund site.

Please find enclosed a copy of *Addendum to Technical Memorandum 2, Results of Phase II TBSA Soil Sampling*, dated May 2000, as well as a copy of *Technical Memorandum 11, Biota and Surface Water Investigations and Wetlands Assessment*, dated May 2000, for the above referenced Superfund site. Please log these documents appropriately and return the Fax Transmittal Form.

If you have any questions please contact me directly.

Sincerely,

Brian von Gunten
Project Manager
Superfund Section
Environmental Response Division
517-373-6808

cc: File, Allied OU, H3
File, River, H3

Fax Transmittal Form

To: Brian von Gunten
Michigan Department of Environmental Quality
Environmental Response Division

Fax Number: (517) 335-4887

From: Saugatuck-Douglas Library

We have received and logged in the following documents:

Addendum to Technical Memorandum 2 and volumes 1, 2 and 3 of Technical Memorandum 11 for the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site

Sincerely,

Martha Boetcher

6-29-00

ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER SUPERFUND SITE

K.16 Highway OU
F6

STATE OF MICHIGAN
DEPARTMENT OF ATTORNEY GENERAL

WILLIAM J. RICHARDS
Deputy Attorney General

300 S. WASHINGTON SQ., SUITE 315
LANSING, MICHIGAN 48913

JENNIFER MULHERN GRANHOLM
ATTORNEY GENERAL

February 9, 2000

Michael Davis
Georgia-Pacific Corporation
133 Peachtree Street
42d Floor
Atlanta, GA 30303

Dear Mr. Davis:

Re: King Highway Landfill

Enclosed please find a signed copy of the Administrative Order by Consent for the King Highway Landfill.

Please call me if you have any questions.

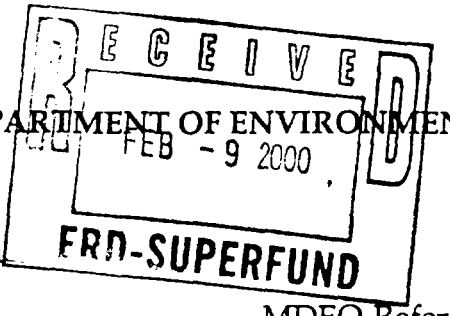
Very truly yours,

Neil D. Gordon
Assistant Attorney General
Natural Resources Division
315 Knapps Centre
300 S. Washington Square
Lansing, MI 48913
(517) 373-7540

NDG/skf
Enc.
c: Scott Cornelius (w/o enclosure)
Anne Pulley (w/o enclosure)

cases/8901470/let to M.Davis of 01/14/00

xc Michelle S
David K
Scott C.
Anne P.
Brady E.



MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

In the Matter of:

Georgia-Pacific Corporation

King Highway Landfill MDEQ Reference No. AOC-ERD-99-010

Kalamazoo County Michigan

Proceeding under Sections 20119 and 20134(1) of Part 201 of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended.

ADMINISTRATIVE ORDER BY CONSENT FOR RESPONSE ACTIVITY

I. JURISDICTION

This Administrative Order by Consent ("Consent Order") is entered into voluntarily by and between the Michigan Department of Environmental Quality ("MDEQ"), Jennifer M. Granholm, Attorney General for the State of Michigan, and Georgia-Pacific Corporation ("Georgia-Pacific"), pursuant to the authority vested in the MDEQ by Sections 20119 and 20134(1) of Part 201 of the Natural Resources and Environmental Protection Act ("NREPA"), MCL §§ 324.20119 and 324.20134(1). This Consent Order concerns the performance by Georgia-Pacific of certain response activities at the King Highway Landfill Operable Unit ("King Highway OU") and the Mill Lagoons of the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site (herein after known as the "Site"), located in Kalamazoo County, Michigan.

II. DENIAL OF LIABILITY

This Consent Order is the product of settlement negotiations and its execution is intended to serve the public interest and the interest of judicial economy. The execution of this Consent Order by Georgia-Pacific is neither an admission or denial of liability with respect to any issue dealt with in this Consent Order nor is it an admission or denial of any factual allegations or legal determinations stated or implied herein, and cannot be introduced or used as

evidence in any other proceedings unrelated to the enforcement of this Consent Order.

III. PARTIES BOUND

3.1 This Consent Order shall apply to and be binding upon the MDEQ and Georgia-Pacific. No change in ownership or corporate status shall in any way alter Georgia-Pacific's responsibilities under this Consent Order. Georgia-Pacific shall provide the MDEQ with written notice prior to the transfer of ownership of part or all of the King Highway OU or the Mill Lagoons and shall provide a copy of this Consent Order to any subsequent owners or successors before ownership rights are transferred. Georgia-Pacific shall not transfer ownership of part or all of the King Highway OU or the Mill Lagoons until it has disclosed all land and resource restrictions that apply to the King Highway OU or the Mill Lagoons as a part of the response activities. Georgia-Pacific shall comply with the requirements of Section 20116 of NREPA, MCL § 324.20116.

3.2 Georgia-Pacific shall provide a copy of this Consent Order to all major contractors, subcontractors, laboratories and consultants retained to conduct any portion of the response activities performed pursuant to this Consent Order within five (5) business days of the effective date of such retention.

3.3 Notwithstanding the terms of any such contract, Georgia-Pacific is responsible for compliance with the terms of this Consent Order, and shall take reasonable steps to ensure that such contractors, subcontractors, laboratories and consultants perform all response activities in conformance with the terms and conditions of this Consent Order.

3.4 The signatories to this Consent Order certify that they are authorized to execute this Consent Order and legally bind the parties they represent.

IV. STATEMENT OF PURPOSE

In entering into this Consent Order, it is the mutual intent of the Parties to: (a) implement the response activities set forth in the Statement of Work ("SOW") at

the King Highway OU and the Mill Lagoons consistent with Parts 201 and 115 of NREPA, MCL §§ 324.20101 *et seq* and 324.11501 *et seq*, the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, 42 U.S.C. §§ 9601 *et seq* ("CERCLA") and the National Contingency Plan, 40 CFR Part 300 *et seq* ("NCP"); (b) prevent, mitigate or otherwise respond to or remedy any release or threatened release of hazardous substances, pollutants or contaminants from the King Highway OU; (c) implement a final remedial action at the King Highway OU and conduct closure at the King Highway Landfill pursuant to Parts 201 and 115 of NREPA, respectively, MCL §§ 324.20101 *et seq* and 324.11501 *et seq;* (d) reimburse the State for future applicable and documented oversight costs as described in Section XXI (Reimbursement of Costs); and (e) minimize litigation.

V. DEFINITIONS

5.1 "Administrative Order by Consent for RI/FS" shall mean the Administrative Order by Consent entered on December 28, 1990, between MDEQ, Georgia-Pacific, Allied Paper Inc./HM Holdings and Plainwell Paper, Inc.

5.2 "CERCLA" shall mean the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, 42 U.S.C. §§ 9601 *et seq*.

5.3 "ERD" means the Environmental Response Division of the MDEQ and its successor entities.

5.4 "Georgia-Pacific" shall mean the Georgia-Pacific Corporation and its successors or assigns.

5.5 "King Highway Landfill" means the property located at King Highway, Kalamazoo, Michigan 49001, north half of the northeast quarter of Section 23, T.2S, R.12W, as identified and legally described in Attachment 1 to this Consent Order. The King Highway Landfill is bordered to the south by M-96 (King Highway), to the east and north by the Kalamazoo River, and to the west by a railroad right-of-way and the King Street Storm Sewer floodplain. The 23.3 acre landfill consists of four

fill areas known as Cells 1, 2, 3, and 4.

5.6 "King Highway OU" or "King Highway Operable Unit" means and includes the King Highway Landfill, and also includes the removal and consolidation of PCB contaminated residuals from the King Street Storm Sewer floodplain and the stretch of the Kalamazoo River adjacent to the King Highway Landfill.

5.7 "Mill Lagoons" means five former lagoons located on the Georgia-Pacific mill property at 2425 King Highway, Kalamazoo, Michigan 49001, as identified and legally described in Attachment 2.

5.8 "MDEQ" refers to the Michigan Department of Environmental Quality, its successor entities, and those authorized persons or entities acting on its behalf.

5.9 "Parties" refers to Georgia-Pacific Corporation and the State of Michigan.

5.10 "Performance Standards" shall mean the cleanup standards and other measures of achievement of the goals of the Response Activities set forth in Section I of the ROD and Section II of the SOW.

5.11 "Record of Decision" or "ROD" shall mean the Record of Decision relating to the King Highway OU and the Mill Lagoons signed on October 17, 1997 by the MDEQ and on February 10, 1998 by the United States Environmental Protection Agency, and all attachments thereto. The ROD is attached to this Consent Order as Attachment 3.

5.12 "Response Activities" shall mean those activities to be undertaken by Georgia-Pacific to implement the SOW.

5.13 "Site" means the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site.

5.14 "Statement of Work" or "SOW" shall mean the statement of work for implementation of the Response Activities, including Remedial Design, Remedial Action, and Operation and Maintenance at the King Highway OU and Mill Lagoons,

and any modifications made in accordance with this Consent Order. The SOW is attached to this Consent Order as Attachment 4.

5.15 "State" means the State of Michigan, including the Department of Attorney General, the Michigan Department of Environmental Quality, the Michigan Department of Natural Resources, and any authorized representative acting on their behalf.

5.16 Unless otherwise stated herein, all terms used in this document which are defined in Section 301 of NREPA, MCL § 324.301 and Part 201 of NREPA, MCL § 324.20101 *et seq.*, or the Part 201 Rules, 1990 AACS R 299.5101, *et seq.*, shall have the same meaning in this document as in Section 301 and Part 201 of NREPA and the Part 201 Rules.

VI. DETERMINATIONS

The State makes the following determinations:

6.1 Georgia-Pacific is a "person" as that term is defined in Section 301(g) of NREPA, MCL § 324.301(g) and Section 101(21) of CERCLA, 42 U.S.C . § 9601 (21).

6.2 The Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site is a "facility" as that term is defined in Section 20101(1)(o) of NREPA, MCL § 324.20101(1)(o) and Section 101(9) of CERCLA, 42 U.S.C. § 9601(9). The Site is located in Kalamazoo and Allegan Counties, Michigan. The Site includes Portage Creek from Cork Street to its confluence with the Kalamazoo River and downstream from Morrow Lake Dam to Lake Michigan. Also included in the Site are five paper residual disposal areas designated as operable units. The Site was included on the National Priorities List ("NPL") pursuant to Section 105 of CERCLA, 42 U.S.C. § 9605. See 40 CFR Part 300, Appendix B, and 55 Fed. Reg. No. 169, p35519 (August 30, 1990).

6.3 The King Highway Operable Unit is within the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site. The King Highway Operable Unit is a "facility" as that term is defined in Section 20101(1)(o) of NREPA, MCL § 324.20101(1)(o) and Section 101(9) of CERCLA, 42 U.S.C. § 9601(9).

6.4 From 1955 to the present, Georgia-Pacific and its predecessor in Kalamazoo, the Kalamazoo Paper Company, disposed of wastewater residuals in the Mill Lagoons and in the King Highway Landfill. The Mill Lagoons were used for disposal of residuals during the middle to late 1950's. From the late 1950's to the present, the residuals were disposed of in the King Highway Landfill. Some of these residuals, specifically residuals generated in the late 1950's, 1960's and early 1970's contained polychlorinated biphenyls ("PCBs") in the form of Aroclor 1242 due to the recycling of carbonless copy paper by the Kalamazoo Paper Company and Georgia-Pacific.

6.5 PCBs are "hazardous substances" as that term is defined in Section 20101(1)(t) of NREPA, MCL § 324.20101(1)(t), and Section 101(14) of CERCLA, 42 U.S.C. § 9601(14).

6.6 The past, present or potential future migration into the environment of PCBs at or from the King Highway OU and Mill Lagoons constitutes an actual "release" or a "threatened release" into the environment as those terms are defined in Section 20101(1)(bb) and (ii) of NREPA, MCL § 324.20101(1)(bb) and (ii).

6.7 Georgia-Pacific is the current owner and operator of the King Highway Landfill. Georgia-Pacific was the owner of the King Highway Landfill and Mill Lagoons from 1966 to the present and is a responsible party under Section 107(a) of CERCLA, 42 U.S.C. § 9607(a) and a liable party under Section 20126 of NREPA, MCL § 324.20126.

6.8 The release or threat of release of hazardous substances at or from the King Highway OU and the Mill Lagoons may pose an imminent and substantial endangerment to the public health, safety, or welfare, or the environment within the meaning of Section 20119 of NREPA, MCL § 324.20119.

6.9 In order to protect public health, safety, or welfare, or the environment, it is necessary and appropriate that response activity be taken. The MDEQ and the Attorney General have determined that Georgia-Pacific will properly implement the

Response Activities required by this Consent Order and that this Consent Order is in the public interest and will minimize litigation.

BASED ON THE FOREGOING FACTS AND DETERMINATIONS, THE MDEQ, THE ATTORNEY GENERAL AND GEORGIA-PACIFIC HEREBY AGREE, AND IT IS HEREBY ORDERED THAT:

VII. IMPLEMENTATION OF RESPONSE ACTIVITIES

7.1 In accordance with this Consent Order, Georgia-Pacific shall submit plans for the performance of the Response Activities. The plans shall be submitted in accordance with the schedule set forth in the SOW and shall include a detailed description of the tasks to be conducted during the implementation of the Response Activities, including the methodology, specifications, and a schedule for implementation, completion of the Response Activities and submission of a final report. Georgia-Pacific shall implement each plan upon approval of each plan pursuant to the procedures provided for in this Consent Order. As approved, each component of each plan, and approved modifications thereto, shall be incorporated into this Consent Order and made an enforceable part of this Consent Order. All work done in accordance with this Consent Order will be considered consistent with the National Contingency Plan, 40 CFR 300 *et seq.*, and its state equivalent.

7.2 Modification of the SOW or Related Plans.

a. If the MDEQ determines that modification to the Response Activities set forth in the SOW and/or in the plans developed pursuant to the SOW is necessary to achieve and maintain the Performance Standards or to carry out and maintain the effectiveness of the remedy set forth in the ROD, the MDEQ may require that such modification be incorporated into the SOW and/or such plans; provided, however, that a modification may only be required pursuant to this paragraph to the extent that it is consistent with the scope of the Response Activities.

b. For the purposes of this paragraph, the scope of the Response Activities is:

i. removal of PCB-contaminated soils and paper residuals from the Mill Lagoons and consolidation of that material into the King Highway Landfill to achieve the industrial cleanup criteria for direct contact with soil of 9.9 parts per million ("ppm") developed pursuant to Section 20120a(1)(d) of NREPA, MCL §§ 324.20120a(1)(d);

ii. removal of PCB-contaminated soils, sediments, and paper residuals from the floodplain adjacent to the Mill Lagoons and consolidation of that material into the King Highway Landfill;

iii. capping and closure of Cells 1-4 of the King Highway Landfill in accordance with Parts 201 and 115 of NREPA, MCL §§ 324.20101 *et seq.* and MCL §§ 324.11501 *et seq.* and the administrative rules promulgated thereunder;

iv. implementation of a final remedial action at Cells 1-4 of the King Highway Landfill to meet the limited industrial cleanup criteria for soil contamination developed pursuant to Section 20120a(1)(i) of NREPA, MCL § 324.20120a(1)(i), and to satisfy the requirements of Sections 20120b(3) and (4) of NREPA, MCL §§ 324.20120b(3) and (4);

v. removal of PCB-contaminated soils, sediments, and paper residuals from the King Street Storm Sewer floodplain, consolidation of that material into the King Highway Landfill, and backfilling and vegetation of the King Street Storm Sewer floodplain. Verification sampling will be conducted, and if the unrestricted residential cleanup criteria of 1.0 parts per million is achieved, the action will be accepted as a final remedy. If this criteria is not achieved, within 45 days, Georgia Pacific will propose, subject to MDEQ's approval, specific additional actions, including an implementation schedule, that will be taken to achieve any of the appropriate State cleanup criteri

vi. removal of PCB-contaminated sediments and paper residuals from the Kalamazoo River directly adjacent to the King Highway Landfill and consolidation of that material into the King Highway Landfill. The removal action at the Kalamazoo River directly adjacent to the King Highway Landfill is interim and may not constitute a final remedial action under Part 201 of NREPA.

c. If Georgia-Pacific objects to any modification determined by the MDEQ to be necessary pursuant to this Section, it may seek dispute resolution pursuant to Section XX (Dispute Resolution). The SOW and/or related plans shall be modified in accordance with the final resolution of the dispute.

d Georgia-Pacific shall implement any work required by any modification incorporated in the SOW and/or plans developed pursuant to the SOW in accordance with this Section.

7.3 Within twenty-one (21) days after issuance of the Certificate of Completion of Construction pursuant to Section XXVII (Certification of Completion of Construction), Georgia-Pacific shall record with the Kalamazoo County Register of Deeds the restrictive covenant attached hereto as Attachment 5. Georgia-Pacific shall provide a true copy of the recorded restrictive covenant to the MDEQ within ten (10) days of Georgia-Pacific's receipt of a copy from the Register of Deeds.

7.4 Nothing in this Section shall be construed to limit the MDEQ's authority to require performance of further Response Activities as otherwise provided in this Consent Order.

VIII. FINANCIAL ASSURANCE MECHANISM

8.1 Georgia-Pacific shall provide a financial assurance mechanism (FAM) in the form of a financial test to secure the performance of the operation and maintenance plan ("O&M Plan"), oversight, monitoring and other costs necessary to secure the effectiveness and integrity of the containment measure set forth in the ROD and SOW in perpetuity.

8.2 The FAM has been set in the amount of $3.75 million. This amount reflects the estimated cost of the O&M Plan, oversight, monitoring and other costs necessary to secure the effectiveness and integrity of the containment measure for the initial thirty (30) year period from the effective date of this Consent Order.

8.3 The financial test shall reflect the costs necessary to satisfy the requirements of Part 201 and its Administrative Rules. The financial test shall be prepared according to Attachment 6 of this Consent Order. Georgia-Pacific shall annually submit an updated financial test along with all supporting information required in Attachment 6 within 90 days of Georgia-Pacific's fiscal year end for the approval of the MDEQ.

8.4 If Georgia-Pacific fails the financial test, Georgia-Pacific shall obtain the MDEQ's approval of, and have in place within 90 days of Georgia-Pacific's fiscal year end, an alternative financial assurance mechanism. An alternative financial assurance mechanism shall allow for reimbursement to the State or the State's designee for the cost of implementing the O&M Plan, oversight, monitoring and other costs necessary to secure the effectiveness and integrity of the containment measure set forth in the SOW in the event Georgia-Pacific fails to implement the O&M Plan, oversight and monitoring in a timely and satisfactory manner.

8.5 Georgia-Pacific shall, in perpetuity, provide an updated O&M plan, including an updated cost estimate for the cost of implementing the O&M Plan for a period of thirty (30) years. The updated cost estimate shall be provided to the MDEQ every five (5) years in perpetuity or until Georgia-Pacific requests and the MDEQ agrees that the O&M Plan is no longer necessary. The updated cost estimate shall include documentation of operation and maintenance costs for the past five (5) years and shall be signed by an officer representing Georgia-Pacific who shall confirm that the documentation is true and accurate. This updated cost estimate shall, subject to review and approval of the MDEQ, be the amount used for the FAM.

8.6 Georgia-Pacific shall notify the Director of the MDEQ, by certified mail, of the commencement of a voluntary or involuntary proceeding under the bankruptcy provisions of Public Law 95-594, 11 U.S.C. Subsection 101-1330, naming Georgia-Pacific as debtor, within ten (10) days after commencement of the proceeding. Such notice shall cite this Consent Order and the notification requirement of this paragraph.

IX. SAMPLING AND ANALYSIS

9.1 All sampling and analysis conducted to implement this Consent Order shall be in conformance with the Quality Assurance Project Plan ("QAPP") and shall follow as appropriate the methodologies prescribed by the Part 201 rules and guidance provided by the MDEQ on sampling locations, parameters, detection limits and analytical methods.

9.2 Georgia-Pacific, or its consultant(s) or subcontractor(s), shall provide the MDEQ ten (10) days notice prior to any sampling activity undertaken pursuant to this Consent Order to allow the MDEQ's Project Coordinator, or his/her authorized representative, to take split or duplicate samples and/or to observe the sampling procedures. In circumstances where ten (10) days notice is not possible, Georgia-Pacific, or its consultant(s) or subcontractor(s), shall provide notice of the planned sampling activity as soon as possible to the MDEQ's Project Coordinator and explain why earlier notification was not possible. If the MDEQ's Project Coordinator concurs with the explanation provided, Georgia-Pacific may forego the 10-day notification period. Georgia-Pacific may, upon written prior request, obtain split samples of any samples taken by MDEQ pursuant to MDEQ's oversight of Georgia-Pacific's implementation of the work.

9.3 Georgia-Pacific shall provide the MDEQ with the results of all environmental sampling and other data generated in the performance or monitoring of any requirement under this Consent Order. Said results shall be included in progress reports as set forth in Section XVI (Progress Reports).

9.4 Georgia-Pacific shall take reasonable steps to assure that the MDEQ and its authorized representatives will be allowed reasonable access to any laboratory utilized by Georgia-Pacific in implementing this Consent Order for quality assurance monitoring.

X. PROJECT COORDINATORS AND COMMUNICATIONS/NOTICES

10.1 Each party shall designate a Project Coordinator. The MDEQ's Project Coordinator is Mr. Scott Cornelius. Georgia-Pacific's Project Coordinator is Dr. Mark Brown. Whenever notice is required to be given or a communication, report, sampling data, analysis of data or other technical submission is required to be forwarded by one party to the other party under this Consent Order, such communication shall be directed to the Project Coordinators at the addresses listed below. All documents required to be submitted to the MDEQ pursuant to this Consent Order shall reference the King Highway OU and the MDEQ reference number of this Consent Order. If any party changes its designated Project Coordinator, the name, address and telephone number of the successor shall be provided to the other party, in writing, as soon as practicable.

As to the MDEQ:

A. For Record Retention pursuant to Section XIV and Financial Assurance matters pursuant to Section VIII:

Patricia McKay
Chief, Compliance and Enforcement Section
Environmental Response Division
Michigan Department of Environmental Quality
P.O. Box 30426
Lansing, MI 48909
Telephone: 517-335-1104
FAX: 517-373-2637

(Via courier)
300 South Washington Square
Lansing, MI 48933

B. For all payments pertaining to this Consent Order:

Michigan Department of Environmental Quality
Revenue Control Unit
P.O. Box 30657
300 South Washington Square, Suite 457
Lansing, MI 48909-8157

C. For all other matters pertaining to this Consent Order:

Scott Cornelius, Project Coordinator
Environmental Response Division
Superfund Section
Michigan Department of Environmental Quality
P.O. Box 30426
Lansing, MI 48909
Telephone: 517-373-7367
FAX: 517-335-4887

As to Georgia-Pacific:

Mark Brown
Blasland Bouck & Lee
6723 Towpath Road
Syracuse, New York 13214-0066
Telephone: 315-446-9120
FAX: 315-445-9161

10.2 Georgia-Pacific's Project Coordinator shall have primary responsibility for overseeing the implementation of the Response Activities and other requirements specified in this Consent Order.

10.3 The MDEQ may designate, upon written notice to Georgia-Pacific's Project Coordinator, other authorized representatives, employees, contractors, and consultants to observe and monitor the progress of any activity undertaken pursuant to this Consent Order.

XI. ACCESS

11.1 Upon reasonable notice to Georgia-Pacific from the effective date of this Consent Order, the MDEQ, its authorized employees, agents, representatives, contractors and consultants, upon presentation of proper credentials, shall have

access at all reasonable times to the King Highway OU and the Mill Lagoons for the purpose of conducting any activity authorized by this Consent Order or otherwise fulfilling any related responsibility under federal or State law with respect to this Consent Order including, but not limited to:

(a) Monitoring the Response Activities or any other activities taking place pursuant to this Consent Order at the King Highway OU and the Mill Lagoons;

(b) Verifying any data or information submitted to the MDEQ;

(c) Conducting investigations relating to contamination at the King Highway OU and the Mill Lagoons or otherwise addressed by the Response Activities;

(d) Obtaining samples;

(e) Assessing the need for or planning and implementing Response Activities at the King Highway OU and the Mill Lagoons;

(f) Assessing compliance with requirements for the implementation of monitoring, operation, maintenance and other measures necessary to assure the effectiveness and integrity of the Response Activities; and

(g) Inspecting and copying relevant non-privileged records, operating logs, contracts or other documents.

11.2 To the extent that the King Highway OU, the Mill Lagoons, or any other area where the Response Activities are to be performed by Georgia-Pacific under this Consent Order is owned or controlled by persons other than Georgia-Pacific, Georgia-Pacific shall use its best efforts to secure from such persons access for the parties and their authorized employees, agents, representatives, contractors and consultants. Georgia-Pacific shall provide the MDEQ with a copy of each access agreement secured pursuant to this Section. For purposes of this paragraph, "best efforts" includes, but is not limited to, reasonable compensation to the owner to secure such access and taking judicial action to secure such access. If, after using best efforts, Georgia-Pacific is unable to obtain access, Georgia-Pacific shall promptly

notify the MDEQ and the MDEQ may agree to assist Georgia-Pacific in gaining access to such property or area.

11.3 Any lease, purchase, contract or other agreement entered into by Georgia-Pacific, which transfers to another party a right of control over the King Highway OU or the Mill Lagoons, or a portion of the King Highway OU or the Mill Lagoons, shall contain a provision preserving for the MDEQ or another party undertaking the Response Activities and their authorized representatives, the access provided under this Section.

11.4 All parties granted access to the King Highway OU or the Mill Lagoons pursuant to this Consent Order shall comply with all applicable health and safety laws and regulations and the Health and Safety Plan for the King Highway OU. All parties are responsible for ensuring that their employees, agents, representatives, contractors and consultants are properly trained and/or certified as to applicable health and safety laws, rules and requirements.

XII. CREATION OF DANGER

Upon obtaining information concerning the occurrence of any event during performance of the Response Activities conducted pursuant to this Order that causes a release or threat of release of a hazardous substance from the King Highway OU or the Mill Lagoons, or that may present an imminent and substantial endangerment to on-site personnel or to the public health, safety, or welfare or the environment, Georgia-Pacific shall immediately undertake all appropriate actions to prevent, abate or minimize such release, threat, or endangerment and shall immediately notify the MDEQ's Project Coordinator or, in the event of his or her unavailability, shall notify the Pollution Emergency Alerting System (PEAS, 1-800-292-4706). In such an event, any action undertaken by Georgia-Pacific shall be in accordance with all applicable health and safety laws and regulations, and with the provisions of the Health and Safety Plan. Within ten (10) days of notifying the MDEQ of such an occurrence Georgia-Pacific shall submit a written report setting

forth the events that occurred and the measures taken and to be taken to mitigate any release, threat, or endangerment caused or threatened by the incident and to prevent recurrence of such an incident. Regardless of whether Georgia-Pacific notifies the MDEQ under this subsection, if the Response Activities undertaken under this Consent Order cause a release or threat of release or may present an imminent and substantial endangerment to on-site personnel or to public health, safety, or welfare or to the environment, the MDEQ may: (a) require Georgia-Pacific to stop response activities at the King Highway OU or Mill Lagoons for such period of time as may be needed to prevent or abate any such release, threat, or endangerment; (b) require Georgia-Pacific to undertake any such activities that the MDEQ determines are necessary to prevent or abate any such release, threat, or endangerment; and/or (c) undertake any actions that the MDEQ determines are necessary to prevent or abate such release, threat, or endangerment. Such actions shall be in accordance with all applicable health and safety laws and regulations and with the applicable provisions of the Health and Safety Plan. In the event that the MDEQ undertakes any action to abate such a release, threat, or endangerment, Georgia-Pacific shall reimburse the State for all costs incurred by the State that are not inconsistent with law. Payment of such costs shall be made in the manner provided in Section XXI (Reimbursement of Costs).

XIII. COMPLIANCE WITH STATE AND FEDERAL LAWS

All actions required to be taken pursuant to this Consent Order shall be undertaken in accordance with the requirements of all applicable or relevant and appropriate state and federal laws and regulations, including Part 201 of NREPA, the Part 201 Rules, Part 115 of NREPA, the Part 115 Rules, CERCLA, the NCP and laws relating to occupational safety and health.

XIV. RECORD RETENTION/ACCESS TO INFORMATION

14.1 Georgia-Pacific and its representatives, consultants and contractors shall preserve and retain, during the pendency of this Consent Order and for a

period of seven (7) years after issuance of the Certificate of Completion under Section XXVIII (Certification of Completion), all records, sampling or test results, charts and other documents relating to releases of hazardous substances or the disposal, treatment or handling activities at the King Highway OU or the Mill Lagoons or any records maintained or generated pursuant to any requirement of this Consent Order.

14.2 Georgia-Pacific shall, upon request and prior to the expiration of the seven year period identified in paragraph 14.1, provide to the MDEQ copies of all non-privileged and non-confidential documents and information within its possession, or within the possession or control of its employees, contractors, agents or representatives relating to the Response Activities at the King Highway OU or the Mill Lagoons or to the implementation of this Consent Order including, but not limited to, sampling, analysis, chain of custody records, manifests, trucking logs, receipts, reports, sample traffic routing, correspondence, or other documents or information related to the releases of hazardous substances or the disposal, treatment or handling activities at the King Highway OU or the Mill Lagoons. After the seven year period has expired, Georgia-Pacific shall notify the MDEQ prior to the destruction or disposal of any documents maintained pursuant to this Section and allow the MDEQ a reasonable opportunity to review and obtain copies of the documents.

14.3 Georgia-Pacific may, in accordance with Section 20117(10) and (11) of NREPA, MCL §§ 324.20117(10) and (11), designate information Georgia-Pacific believes to be entitled to protection or confidentiality. If no such claim accompanies the information when it is submitted to the MDEQ, the information may be made available to the public by the MDEQ without further notice to Georgia-Pacific. Information described in subsections 20117(11)(a)-(h) of NREPA, MCL § 324.20117(11)(a)-(h) shall not be claimed as confidential or privileged by Georgia-Pacific. Information or data generated under this Consent Decree shall not be

subject to Part 148 of NREPA, MCL § 324.14801 et seq.

XV. SUBMISSIONS AND APPROVALS

15.1 All plans, reports, schedules, and submittals (collectively, "Submissions") required by this Consent Order shall be delivered to the MDEQ in accordance with the schedule set forth in this Consent Order and in the SOW. Prior to receipt of the MDEQ's approval, any plan, report or submittal submitted to the MDEQ for approval shall be marked "Draft" and shall include, in a prominent location in the document, the following disclaimer: "Disclaimer: This document is a DRAFT document, which has not received final acceptance from the Michigan Department of Environmental Quality ("MDEQ"). This document was prepared pursuant to a governmental Administrative Consent Order."

15.2 Upon receipt of any Submission relating to the Response Activities that is required to be submitted for approval pursuant to this Consent Order, the MDEQ Project Coordinator will in writing: (a) approve the Submission; (b) disapprove the Submission, notifying Georgia-Pacific of deficiencies; or (c) approve the Submission with modifications, notifying Georgia-Pacific of the reasons for the modifications. Upon receipt of a notice of approval or approval with modification from the MDEQ, Georgia-Pacific shall proceed to take any action required by the Submission as approved or as modified, and shall submit a new cover page and the modified pages of the Submission marked "Final".

15.3 Notice of any disapproval will specify the reason(s) for the disapproval. Unless a notice of disapproval specifies a longer time period, upon receipt of a notice of disapproval from the MDEQ, Georgia-Pacific shall, within thirty (30) days thereafter, correct the deficiencies and resubmit the Submission for approval. Notwithstanding a notice of disapproval, Georgia-Pacific shall proceed to take any response activity not directly related to the deficient portion of the Submission.

15.4 If, upon resubmission, the Submission is not approved, the MDEQ shall so advise Georgia-Pacific and Georgia-Pacific shall be deemed by MDEQ to be in

violation of this Consent Order as of the date of resubmission.

15.5 Georgia-Pacific may invoke Dispute Resolution pursuant to Section XX (Dispute Resolution) of this Consent Order upon the issuance of any MDEQ disapproval or directed modification or upon a finding by the MDEQ that Georgia-Pacific is in violation of this Consent Order for failure to correct the deficiencies in a Submission.

15.6 Any Submission and attachments to Submissions required by the Consent Order which have been approved by the MDEQ are incorporated into this Consent Order. Any delay or non-compliance with such Submissions or attachments to a Submission shall be considered delay or noncompliance with the requirements of this Consent Order and shall subject Georgia-Pacific to penalties pursuant to Section XXII (Stipulated Penalties).

15.7 A finding of approval or approval with modifications shall not be construed to mean that the MDEQ concurs with all conclusions, methods, or statements in the Submissions.

15.8 No informal advice, guidance, suggestions or comments by the MDEQ regarding any Submissions or any other writing submitted by Georgia-Pacific shall be construed as relieving Georgia-Pacific of its obligations to obtain such formal approval as may be required by this Consent Order.

XVI. PROGRESS REPORTS

Georgia-Pacific shall provide to the MDEQ Project Coordinator written monthly progress reports relating to the Response Activities that shall: (a) describe the activities that have been taken toward achieving compliance with this Consent Order during the previous thirty (30) days; (b) describe data collection and activities scheduled for the next thirty (30) days; and (c) include all results of sampling and tests and other data received by Georgia-Pacific, its employees or authorized representatives during the previous thirty (30) days relating to the Response Activities performed pursuant to this Consent Order. The first monthly report shall

be submitted to the MDEQ within thirty (30) days following the effective date of this Consent Order and monthly thereafter until the completion of construction activities at the King Highway OU or the Mill Lagoons. After issuance of a Certificate of Completion of Construction is issued by the MDEQ, as provided in Section XXVII (Certification of Completion of Construction), progress reports shall be submitted pursuant to the schedules set forth in the plans identified in the SOW.

XVII. INDEMNIFICATION AND INSURANCE

17.1 Georgia-Pacific shall indemnify and hold harmless the State of Michigan and its departments, agencies, officials, agents, employees, contractors and representatives for any and all claims or causes of action arising from or on account of negligent acts or omissions of Georgia-Pacific, its officers, employees, agents or any persons acting on its behalf or under its control in carrying out the Response Activities pursuant to this Consent Order. Neither the State of Michigan nor any of its departments, agencies, officials, agents, employees, contractors or representatives shall be held out as a party to any contract entered into by or on behalf of Georgia-Pacific in carrying out actions pursuant to this Consent Order. Neither Georgia-Pacific nor any contractor shall be considered an agent of the State of Michigan.

17.2 Prior to commencing any of the Response Activities pursuant to this Consent Order, Georgia-Pacific shall secure and maintain for the duration of this Consent Order comprehensive general liability insurance with limits of one million dollars ($1,000,000.00) combined single limit, naming the MDEQ, the Attorney General for the State of Michigan and the State of Michigan as additional insured parties or Georgia-Pacific shall provide assurance of similar coverage should Georgia-Pacific self-insure the work to be performed under this Consent Order. If Georgia-Pacific demonstrates by evidence satisfactory to the MDEQ that any contractor or subcontractor maintains insurance equivalent to that described above, then with respect to that contractor or subcontractor, Georgia-Pacific needs to provide only that portion, if any, of the insurance described above that is not

maintained by the contractor or subcontractor. Regardless of the method used to insure, and prior to commencement of the Response Activities pursuant to this Consent Order, Georgia-Pacific shall provide the MDEQ Project Coordinator and the Attorney General with certificates evidencing said insurance and the MDEQ's, the Attorney General's, and the State of Michigan's status as additional insured parties. In addition, for the duration of this Consent Order, Georgia-Pacific shall satisfy, or shall take reasonable steps to ensure that its contractors or subcontractors satisfy, all applicable laws and regulations regarding the provision of Workers' Disability Compensation Insurance for all persons performing the Response Activities on behalf of Georgia-Pacific in furtherance of this Consent Order.

XVIII. MODIFICATIONS

18.1 Schedules specified in this Consent Order for completion of the Response Activities may be modified by written agreement between Georgia-Pacific's Project Coordinator and MDEQ's Project Coordinator. All such modifications shall be made in writing.

18.2 Except as provided for in paragraph 7.2 (Modification of the SOW or Related Plans) of this Consent Order, no material modifications shall be made to the SOW without written approval of Georgia-Pacific's Project Coordinator and the MDEQ ERD Division Chief or his or her representative. Prior to providing its approval to any material modification of the SOW, the MDEQ will provide the U.S. EPA with a reasonable opportunity to review and comment on the proposed modification.

XIX. DELAYS IN PERFORMANCE

19.1 Georgia-Pacific shall perform the requirements of this Consent Order within the time limits established herein, unless performance is prevented or delayed by events which constitute a "Force Majeure." Any delay in the performance attributable to a "Force Majeure" shall not be deemed a violation of Georgia-Pacific's obligations under this Consent Order.

19.2 For the purpose of this Consent Order "Force Majeure" means an occurrence or non-occurrence arising from causes not foreseeable, beyond the control of and without the fault of Georgia-Pacific or its agents, representatives, contractors or consultants such as: an Act of God; extraordinary weather events; natural disasters; national emergencies; untimely review of permit applications or Submissions by the MDEQ or other applicable authority; and acts or omissions of third parties that could not have been avoided or overcome by Georgia-Pacific's due diligence and that delay the performance of an obligation under this Consent Order. "Force Majeure" does not include, among other things, unanticipated or increased costs, changed financial circumstances, or failure to obtain a permit or license as a result of Georgia-Pacific's actions or omissions.

19.3 Georgia-Pacific shall notify the MDEQ by telephone, or telefax or writing within seventy-two (72) hours of discovering any event which causes a delay in its compliance with any provision of this Consent Order. Verbal notice shall be followed by written notice within ten (10) calendar days and shall describe in detail the anticipated length of delay, the precise causes of the delay, the measures taken and to be taken by Georgia-Pacific to avoid, minimize or overcome the delay, and the timetable by which those measures shall be implemented. Georgia-Pacific shall adopt all reasonable measures to avoid or minimize any such delay.

19.4 Failure of Georgia-Pacific to comply with the notice requirements of paragraph 19.3 above shall render this Section XIX void and of no force and effect as to the particular incident involved. The MDEQ may, at its sole discretion and in appropriate circumstances, waive the notice requirements of paragraph 19.3.

19.5 If the parties agree that a delay or anticipated delay was beyond the control of Georgia-Pacific, this may be so stipulated and the time for performance of the obligations affected by the delay under this Consent Order will be modified accordingly. If the parties to this Consent Order are unable to reach such agreement, the dispute shall be resolved in accordance with Section XX (Dispute Resolution) of

this Consent Order. Georgia-Pacific shall have the burden of proving that any delay was beyond the reasonable control of Georgia-Pacific and that all the requirements of this Section XIX (Delays In Performance) have been met.

19.6 An extension of one compliance date based upon a particular incident does not necessarily mean that Georgia-Pacific qualifies for an extension of a subsequent compliance date without providing proof regarding each incremental step or other requirement for which an extension is sought.

XX. DISPUTE RESOLUTION

20.1 The dispute resolution procedures of this Section shall apply without limitation to all provisions of this Consent Order except where expressly stated otherwise. If Georgia-Pacific objects to any notice of disapproval, modification, or any decision concerning a requirement of Sections VII (Implementation of Response Activities, IX (Sampling and Analysis), XV (Submissions and Approvals) and XVIII (Modifications) of this Consent Order, Georgia-Pacific shall notify the MDEQ, in writing, of its objections within fourteen (14) days of receipt of the notice. The MDEQ and Georgia-Pacific shall have fourteen (14) days from the receipt by the MDEQ of the notification of objection to reach agreement. If agreement cannot be reached on any issue within this fourteen (14) day period, the MDEQ shall provide a written statement of its decision to Georgia-Pacific and in the absence of initiation of formal dispute resolution by either party under paragraph 20.2, the MDEQ's decision shall be binding on the Parties.

20.2 If Georgia-Pacific and the MDEQ cannot informally resolve a dispute under paragraph 20.1, then Georgia-Pacific may initiate formal dispute resolution by requesting review of disputed issues by the Chief of the MDEQ's Environmental Response Division. This written request must be filed with the Chief of the MDEQ's Environmental Response Division and the MDEQ Project Coordinator within fourteen (14) days of receipt by Georgia-Pacific of the MDEQ statement of decision issued as part of the informal dispute resolution process as set forth in paragraph

20.1. The request shall state the issues in dispute; the relevant facts upon which the dispute is based; any factual data, analysis, or opinion supporting its position; and all supporting documentation on which the party relies. The MDEQ shall, within fourteen (14) days after receiving the written request for review by the Chief of the MDEQ's Environmental Response Division, provide a written reply to Georgia-Pacific stating its understanding of the issues in dispute, the relevant facts upon which the dispute is based, any factual data, analysis, or opinion supporting its position, and all supporting documentation on which the party relies. The decision of the Chief of the MDEQ's Environmental Response Division shall be binding on the parties.

20.3 If Georgia Pacific seeks to challenge any decision or notice issued by the MDEQ or the Attorney General under this Consent Order other than those addressed in paragraph 20.1, Georgia Pacific shall send a written notice of objections to both the MDEQ Project Manager and the Assistant Attorney General assigned to this matter within fourteen (14) days from receipt of the notice or decision by the MDEQ or the Attorney General. The MDEQ, the Attorney General and Georgia-Pacific shall have fourteen (14) days from the receipt by the MDEQ and the Attorney General of the notification of objection to reach agreement. If agreement cannot be reached on any issue within this fourteen (14) day period, the MDEQ and the Attorney General shall provide a written statement of its decision to Georgia-Pacific.

20.4 In the event Georgia-Pacific does not commence the activities required by the MDEQ decision under paragraph 20.2 or the MDEQ or the Attorney General decision under paragraph 20.3 above within fourteen (14) days after receipt of that decision, the Department of Attorney General, on behalf of the MDEQ, may take such civil enforcement actions against Georgia-Pacific as may be provided for by Sections 20119(4) and 20137(1) of NREPA, MCL §§ 324.20119(4) and 324.20137(1), and other statutory and/or equitable authorities, to enforce the terms of this Consent Order. In such an event, the MDEQ retains the right to perform necessary response

activities and to recover the costs thereof from Georgia-Pacific. Engagement of a dispute resolution among the Parties shall not be cause for the delay of any Response Activities not the subject of or related to the dispute resolution proceeding.

20.5 Notwithstanding this Section, Georgia-Pacific shall pay that portion of a demand for reimbursement of costs or payment of stipulated penalties that is not subject to a good faith dispute resolution in accordance with and in the manner provided in Sections XXI (Reimbursement of Costs) and XXII (Stipulated Penalties), as appropriate.

20.6 No action or decision of the MDEQ or the Attorney General shall constitute final agency action giving rise to any rights of judicial review prior to the Attorney General's initiation of judicial action to compel Georgia-Pacific to comply with this Consent Order or to enforce a term, condition or other action required by this Consent Order in accordance with Section 20137 of NREPA, MCL § 324.20137. Nothing in this Consent Order shall expand Georgia-Pacific's ability to obtain pre-enforcement review of this Consent Order.

XXI. REIMBURSEMENT OF COSTS

21.1 For purposes of this Consent Order, the term "Oversight Costs" are costs related to the State's oversight, enforcement, monitoring and documentation of compliance with this Consent Order and that are consistent with State law or not inconsistent with the NCP. Oversight Costs may include costs incurred to monitor the Response Activities at the King Highway OU and the Mill Lagoons; observe and comment on field activities; review and comment on Submissions; collect and evaluate samples; purchase equipment and supplies to perform monitoring activities; attend and participate in meetings; prepare cost reimbursement documentation; and enforce, monitor and document compliance with this Consent Order.

21.2 Georgia-Pacific shall reimburse the State for all Oversight Costs that are

consistent with State law or not inconsistent with the NCP and incurred by the State in overseeing the Response Activities for matters covered in this Consent Order. As soon as possible after each anniversary of the effective date of this Consent Order, pursuant to Sections 20119(4) and 20137(1) of NREPA, MCL §§ 324.20119(4) and 324. 20137(1), the MDEQ will provide Georgia-Pacific with a written demand of Oversight Costs lawfully incurred by the State of Michigan. Any such demand will set forth with reasonable specificity the nature of the costs incurred and shall include a full and complete accounting of all demands made hereunder, including but not limited to all relevant and available time sheets, travel vouchers, contracts, invoices, progress reports, payment vouchers and other relevant documents.

21.3 Except as provided by Section XX (Dispute Resolution), Georgia-Pacific shall reimburse the MDEQ for such costs within sixty (60) days of receipt of a written demand from the MDEQ. In any challenge by Georgia-Pacific to a demand for recovery of Oversight Costs by the MDEQ, Georgia-Pacific shall have the burden of establishing that the costs were not incurred in accordance with Section 20126a(1)(a) of NREPA, MCL § 324.20126a(1)(a). All payments made pursuant to this Consent Order shall be by certified check payable to the "State of Michigan - Environmental Response Fund," and shall be sent by first-class mail to the address listed in Section X (Project Coordinators and Communications/Notices). The King Highway OU and Consent Order Reference Number shall be identified on each check. A copy of the transmittal letter and the check shall be provided simultaneously to the MDEQ Project Coordinator and the Assistant Attorney General in Charge, Department of the Attorney General, Natural Resources Division, Knapp's Office Centre, Suite 315, 300 South Washington Square, Lansing, Michigan 48913. Costs recovered pursuant to this Section shall be deposited in the Environmental Response Fund in accordance with the provisions of Section 20108(3) of NREPA, MCL § 324.20108(3).

XXII. STIPULATED PENALTIES

22.1 Except as provided by Sections XX (Dispute Resolution) and XIX (Delays in Performance), if Georgia-Pacific fails or refuses to comply with any term or condition in Sections VII (Implementation), XII (Creation of Danger), VIII (Financial Assurance Mechanism), and XXII (Stipulated Penalties), Georgia-Pacific shall pay the MDEQ stipulated penalties in the following amounts for each day for every failure or refusal to comply or conform:

Period of Delay	Penalty Per Violation Per Day
1st through 15th day	$250.00
16th through 30th day	$500.00
Beyond 30 Days	$4500.00

22.2 Except as provided in Sections XIX (Delays in Performance) and XX (Dispute Resolution), if Georgia-Pacific fails or refuses to comply with any other term or condition of this Consent Order Georgia-Pacific shall pay the MDEQ stipulated penalties of $150.00 a day for each and every failure or refusal to comply.

22.3 Stipulated penalties shall begin to accrue on the day performance was due, or other failure or refusal to comply occurred, and shall continue to accrue until the final day of correction of the noncompliance. Separate penalties shall accrue for each separate failure or refusal to comply with the terms and conditions of this Consent Order.

22.4 Except as provided in Section XX (Dispute Resolution), stipulated penalties owed to the State shall be paid no later than sixty (60) days after receiving a written demand from the State. Payment shall be made in the manner provided in Section XXI (Reimbursement of Costs). Interest shall accrue on the unpaid balance at the end of the sixty (60) day period at the rate provided for in Section 20126a(3) of NREPA, MCL § 324.20126a(3). Unless dispute resolution is invoked, failure to pay the stipulated penalties within sixty (60) days after receipt of a written demand constitutes a further violation of the terms and conditions of this Consent Order.

22.5 Liability for or payment of stipulated penalties are not the State's exclusive remedy in the event Georgia-Pacific violates this Consent Order. The State reserves the right to pursue any other remedy or remedies that it is entitled to under this Consent Order or any applicable law for any failure or refusal of Georgia-Pacific to comply with the requirements of this Consent Order.

XXIII. COVENANT NOT TO SUE BY THE STATE

23.1 In consideration of the actions that will be performed and the payments that will be made by Georgia-Pacific under the terms of this Consent Order, and except as specifically provided in this Section and in Section XXVI (Reservation of Rights by the State), the State of Michigan hereby covenants not to sue or to take further administrative action against Georgia-Pacific for claims arising from:

(a) Performance of the approved Response Activities excluding operation and maintenance by Georgia-Pacific under this Consent Order, and specifically excluding releases to the Kalamazoo River;

(b) Performance of the approved Response Activities including operation and maintenance by Georgia-Pacific under this Consent Order, and specifically excluding releases to the Kalamazoo River;

(c) Payment of Oversight Costs incurred by the State after the effective date of this Consent Order.

23.2 With respect to liability for performance of the approved Response Activities excluding operation and maintenance by Georgia-Pacific under this Consent Order, the covenant not to sue in Paragraph 23.1 shall take effect upon issuance by the MDEQ of the Certificate of Completion of Construction in accordance with Section XXVII (Certification of Completion of Construction). With respect to liability for performance of approved Response Activities including operation and maintenance by Georgia-Pacific under this Consent Order, the covenant not to sue in Paragraph 23.1 shall take effect upon issuance by the MDEQ

of the Certificate of Completion in accordance with Section XXVIII (Certification of Completion). With respect to liability for payment of Oversight Costs incurred by the State after the effective date of this Consent Order, the covenant not to sue in Paragraph 23.1 shall take effect upon payment of those costs pursuant to Section XXI (Reimbursement of Costs) of this Consent Order. The covenant not to sue is conditioned upon the complete and satisfactory performance by Georgia-Pacific of its obligations under this Consent Order. The covenant not to sue extends only to Georgia-Pacific and does not extend to any other person as defined under NREPA or CERCLA.

XXIV. COVENANT NOT TO SUE BY GEORGIA-PACIFIC

24.1 Georgia-Pacific hereby covenants not to sue or take any civil, judicial or administrative action against the State, its agencies or their authorized representatives for any claims or cause of action against the State with respect to the King Highway OU and the Mill Lagoons arising from the State's actions pursuant to this Consent Order, including any direct or indirect claim for reimbursement from the Environmental Response Fund pursuant to Section 20119(5) of NREPA, MCL § 324.20119(5), or any other provision of law. Georgia-Pacific reserves any and all rights against the State of Michigan, its agencies or their authorized representatives, for actions by the State resulting in a release or threat of release of hazardous substances at the Site. The State reserves its right to raise any defenses to such an action.

24.2 In any subsequent administrative or judicial proceeding initiated by the Attorney General for injunctive relief, recovery of response activity costs, or other appropriate relief relating to the King Highway OU or the Mill Lagoons, Georgia-Pacific agrees not to assert, and may not and shall not maintain any defense or claim based upon the principles of waiver, res judicata, collateral estoppel, issue preclusion, claim-splitting or other defenses based upon any contention that the claims raised by the MDEQ or the Attorney General in the subsequent proceeding

were or should have been brought in this case; provided, however, that nothing in this paragraph affects the enforceability of the covenants not to sue set forth in Section XXIII (Covenant Not to Sue by the State).

XXV. CONTRIBUTION PROTECTION

Pursuant to Section 20129(5) of NREPA, MCL § 324.20129(5), and to the extent provided in Section XXIII (Covenant Not to Sue by the State), Georgia-Pacific shall not be liable for claims for contribution for the matters set forth in Paragraph 23.1 of this Consent Order. Entry of this Consent Order does not discharge the liability of any other person(s) that may be liable under Section 20126 of NREPA, MCL § 324.20126, and/or CERCLA. Nothing in this Consent Order shall be construed to create any rights in, or grant any cause of action to any person not a party to this Consent Order. In any action by Georgia-Pacific for contribution from any person not a party to this Order, Georgia-Pacific's cause of action shall be subordinate to the right of the State of Michigan if the State files an action pursuant to NREPA or other applicable federal or state law, in accordance with Section 20129(9) of NREPA, MCL § 324.20129(9).

XXVI. RESERVATION OF RIGHTS BY THE STATE

26.1 The MDEQ and the Attorney General reserve the right to bring an action against Georgia-Pacific under federal or state law for any matters that are not covered by or addressed in this Consent Order. This includes, but is not limited to, the right to bring an action against Georgia-Pacific under federal or state law to require additional response activities pertaining to the Kalamazoo River, including the area adjacent to the King Highway OU and the Mill Lagoons.

26.2 The MDEQ and the Attorney General expressly reserve any and all rights and defenses pursuant to any available legal authority that they may have to enforce this Consent Order against Georgia-Pacific.

26.3 Notwithstanding any other provision of this Consent Order, the MDEQ retains all authority and reserves all rights to take any and all response activity(ies)

authorized by law. The MDEQ may perform, or contract to have performed, any and all portions of the response activity(ies) as the MDEQ determines necessary and to recover response activity costs.

26.4 Failure by the MDEQ or the Attorney General to timely enforce any term, condition or requirement of this Consent Order shall not:

(a) Provide or be construed to provide a defense for Georgia-Pacific's noncompliance with any such term, condition or requirement of this Consent Order; or

(b) Estop or limit the authority of the MDEQ or the Attorney General to later enforce any such term, condition or requirement of the Consent Order or seek any other remedy provided by law.

26.5 The covenant not to sue set forth in Section XXIII (Covenant Not to Sue by the State) does not pertain to any matters other than those expressly specified in Paragraph 23.1. The State reserves, and this Consent Order is without prejudice to, all rights against Georgia-Pacific with respect to all other matters including, but not limited to, the following: (a) liability arising from a violation by Georgia-Pacific of a requirement of this Consent Order, including conditions of an approved Submission required herein; (b) liability arising from the past, present or future treatment, handling, disposal, release or threat of release of hazardous substance(s) not attributable to the King Highway OU or the Mill Lagoons; (c) liability arising from the past, present or future treatment, handling, disposal, release or threat of release of hazardous substance(s) taken from the King Highway OU; (d) liability for damages for injury to, destruction of, or loss of natural resources; (e) liability for criminal acts; (f) any matters for which the State is owed indemnification under Section XVII (Indemnification and Insurance) of this Consent Order; (g) liability arising from releases of hazardous substances or violations of federal or state law which occur during or after implementation of the Response Activities; (h) liability for any other response activities required to address environmental contamination

at the Site; and (i) liability for response activity costs other than those referred to in Section XXI (Reimbursement of Costs) of this Consent Order and the costs resolved pursuant to the Administrative Order by Consent for RI/FS.

26.6 The State's Post Certification of Completion Reservations:

Notwithstanding any other provision of this Consent Order, the State reserves, and this Consent Order is without prejudice to, the right to institute proceedings in this action or in a new action or to issue an administrative order seeking to compel Georgia-Pacific (1) to perform further response activities relating to the King Highway OU or the Mill Lagoons (2) to reimburse the State of Michigan for additional costs of response if, subsequent to Certification of Completion of Construction: (a) conditions of the King Highway OU or Mill Lagoons, previously unknown to the MDEQ, are discovered after the entry of this Consent Order, or (b) information is received, in whole or in part, after the entry of this Consent Order and these previously unknown conditions or this information, together with any other relevant information, indicates that Response Activity(ies) are not protective of the public health, safety or welfare or the environment.

26.7 For purposes of Paragraph 26.6, the information previously received by and the conditions known to the MDEQ shall include only that information and those conditions set forth in the administrative record supporting the Response Activities, and any information received by the MDEQ pursuant to the requirements of this Consent Order prior to Certification of Completion of Construction.

26.8 The parties acknowledge and agree that this Consent Order does not constitute a warranty or representation of any kind by the MDEQ that the Response Activity(ies) performed in accordance herein will result in the achievement of the remedial criteria as established by law.

26.9 Notwithstanding any provision of this Consent Order, the MDEQ and the Attorney General shall retain all of their information gathering, inspection,

access and enforcement authorities and rights under Part 201 of NREPA and any other applicable statute or regulation.

26.10 Nothing in this Consent Order shall limit the power and authority of the MDEQ or the State of Michigan to take, direct or order all appropriate action to protect the public health, welfare and safety, or the environment, or to prevent, abate or minimize a release or threat of release of hazardous substances, pollutants or contaminants on, at or from the Site.

XXVII. CERTIFICATION OF COMPLETION OF CONSTRUCTION

27.1 When Georgia-Pacific determines that it has completed the construction phase required by this Consent Order, it shall submit to the MDEQ a Notification of Completion of Construction and a draft Final Report for Completion of Construction. The construction phase includes the removal and consolidation of PCB residuals into the King Highway Landfill, construction of the landfill cap over Cells 1 through 4, and installation of the monitoring system as set forth in Sections II and III of the SOW. The draft Final Report for Completion of Construction shall summarize all response activities performed under this Consent Order relating to the construction phase. The draft Final Report for Completion of Construction shall include or reference any supporting documentation.

27.2 Upon receipt of the Notification of Completion of Construction, the MDEQ will review the Notification of Completion of Construction, the draft Final Report for Completion of Construction, any supporting documentation and the actual response activities performed pursuant to this Consent Order. Within ninety (90) days of receipt of Notification of Completion of Construction, the MDEQ will determine whether Georgia-Pacific has satisfactorily completed all requirements of this Consent Order relating to construction. If the MDEQ determines that all requirements have been satisfied, the MDEQ will so notify Georgia-Pacific, and upon receipt of a Final Report for Completion of Construction in accordance with Section XV (Submissions and Approvals), shall issue a Certificate of Completion of

Construction.

XXVIII. CERTIFICATION OF COMPLETION

28.1. When Georgia-Pacific determines that it has completed all requirements of this Consent Order, including, but not limited to completing the Response Activities required by this Consent Order, Georgia-Pacific shall submit to the MDEQ a Notification of Completion and a draft Final Report. The draft Final Report shall summarize all response activities performed under this Consent Order. The draft Final Report shall include or reference any supporting documentation.

28.2 Upon receipt of the Notification of Completion, the MDEQ will review the Notification of Completion, the draft Final Report, any supporting documentation and the actual Response Activities performed pursuant to this Consent Order. Within ninety (90) days of receipt of the Notification of Completion, the MDEQ will determine whether Georgia-Pacific has satisfactorily completed all requirements of this Consent Order, including, but not limited to, completing the Response Activities required by this Consent Order, complying with all terms and conditions of this Consent Order and paying any and all cost reimbursement and stipulated penalties owed to the MDEQ. If the MDEQ determines that all requirements have been satisfied, the MDEQ will so notify Georgia-Pacific, and upon receipt of a Final Report in accordance with Section XV (Submissions and Approvals), shall issue a Certificate of Completion.

XXIX. TERMINATION

Upon issuance of a Certificate of Completion in accordance with Section XXVIII (Certification of Completion), Georgia-Pacific's obligations as set forth in this Consent Order shall terminate with the exception of the requirements in Section XIV (Record Retention/Access To Information).

XXX. SEPARATE DOCUMENTS

This Consent Order may be executed in two (2) or more counterparts, each of which shall be deemed an original, but all of which together shall constitute one

and the same instrument. This Consent Order may be executed in duplicate original form.

XXXI. SEVERABILITY

The provisions of this Consent Order shall be severable, and if any provision is declared by a court of competent jurisdiction to be inconsistent with federal or state law, and therefore unenforceable, the remaining provisions of this Consent Order shall remain in full force and effect.

XXXII. EFFECTIVE DATE

This Consent Order is effective upon Signature of the Director's designee. All times for performance of obligations under this Consent Order shall be calculated from the effective date. For the purposes of this Consent Order, the term "day" shall mean a calendar day unless otherwise noted herein.

Date: 2-8-00

Alan J. Howard, Chief
Environmental Response Division
Michigan Department of Environmental Quality
First Floor, Knapps Center
300 S. Washington Square
Lansing, Michigan 48933

Date: February 7, 2000

Neil D. Gordon
Assistant Attorney General
Michigan Department of Attorney General
Natural Resources Division
Suite 3015, Kanpps Center
300 S. Washington Square
Lansing, Michigan 48913

Date: January 28th

Michael D. Tompkins
General Manager, Manufacturing
Georgia-Pacific Corporation
2425 King Highway
Kalamazoo, MI 49001

ATTACHMENT 1

Legal Decription of King Highway Landfill

Commencing in the North and South ¼ line of Section 23. T.2S., R.11 W. at the North line of a 200.00 foot Right-of-way for King Highway and running thence South 85°-49' East along said Right-of-way line. 1,182.29 feet for the place of beginning: thence North 43°-24' West to a point of intersection of the East line of Upjohn Avenue, according to the Plat of Riverside as extended Northerly; thence Northerly along the said East line of Upjohn Avenue extended to the Westerly bank of the Kalamazoo River: thence upstream along the Southerly and Westerly bank of the Kalamazoo River and following the meander as now existing to a point on the North Right-of-way line of King Highway: thence North 85°-49' West along the said North Right-of-way line of King Highway to the point of beginning.

ATTACHMENT 2

Legal Description of the Mill Lagoons

Commencing at the intersection of the North-South 1/4 line of Section 23, T2S, R11W Kalamazoo County, Michigan, and the North line of King Highway (200' feet wide); thence S85°49'00"E 1182.29 feet along the North line of said King Highway; thence N43°24'00"W 926.25 feet to a point on the East line of Upjohn Avenue; thence NOO°35'47"E 1032.39 feet along the East line of Upjohn Avenue; thence S89°24'13"E 634.07 feet for a PLACE OF BEGINNING; thence S68°43'15"W 462.37 feet; thence SOO°24'07"W 246.45 feet; thence S29°21'45"E 131.57 feet; thence N61°44'28"E 31.64 feet; thence N58°37'42"E 79.27 feet; thence N62°08'43"E 64.13 feet; N72°52'54"E 77.41 feet; thence N59°16'15"E 165.00 feet to the Place of Beginning, being part of the Northeast 1/4 of said Section 23, containing 1.54 acres of land, more or less.

Commencing at the intersection of the North-South 1/4 line of Section 23, T2S, R11W Kalamazoo County, Michigan, and the North line of King Highway (200 feet wide); thence S85°49'00"E 1182.29 feet along the North line of said King Highway; thence N43°24'00"W 926.25 feet to a point on the East line of Upjohn Avenue; thence N00°35'47"E 480.67 feet along the East line of Upjohn Avenue; thence S89°24'13"E 143.34 feet for a PLACE OF BEGINNING; thence S87°24'13"E 389.64 feet; thence N03°22'37"W 170.79 feet; thence N74°24'19"W 272.40 feet; thence S27°19'27"W 254.47 feet to the Place of Beginning, being part of the Northeast 1/4 of said Section 23, containing 1.86 acres of land, more or less.

DECLARATION
SELECTED REMEDIAL ALTERNATIVE
FOR THE KING HIGHWAY LANDFILL - OPERABLE UNIT 3 OF THE ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER SUPERFUND SITE
CITY OF KALAMAZOO, MICHIGAN

Statement of Basis and Purpose

This decision document presents the selected remedial action (RA) for the King Highway Landfill-Operable Unit 3 (KHL-OU 3) and the Georgia-Pacific former lagoons 1, 2, 3, 4, and 5, (five former lagoons) of the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund site (site). The KHL-OU 3 includes the King Highway Landfill (KHL), the King Street Storm Sewer (KSSS) floodplain, and the stretch of the Kalamazoo River adjacent to the KHL. The KHL-OU 3 and the five former lagoons are located in the city of Kalamazoo, Michigan. The remedy was chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 1980 PL 96-510, as amended by the Superfund Amendments and Reauthorization Act of 1986 and, to the extent practicable, the National Oil and Hazardous Substances Contingency Plan. This Record of Decision (ROD) addresses the five former lagoons and the KHL-OU 3 which is one of four Operable Units at the site. This decision is based on the administrative record for the KHL-OU 3 and the five former lagoons.

Assessment of the Site

Actual or threatened release of hazardous substances from the KHL-OU 3 and the five former lagoons, if not addressed by implementing the response action in this ROD, may present an imminent and substantial endangerment to public health, welfare, or the environment.

Description of the Selected Remedy

This remedy is intended to be the final action for the five former lagoons and the KHL-OU 3 of the site. The purpose of this remedy is to eliminate or reduce the potential migration of polychlorinated biphenyls (PCBs) to the Kalamazoo River and to reduce the risk associated with exposure to the PCB-contaminated materials. This RA includes excavation and on-site containment of PCB-contaminated soils, sediments and paper residuals (residuals) from the landfill berms (berms), the five former lagoons, as well as from the river and floodplains adjacent to the KHL. This RA will address the principal threat posed by the five former lagoons and the KHL-OU 3 by controlling the current and potential release of PCB contamination to the Kalamazoo River. The RA addresses the following migration pathways from the KHL-OU 3 and the five former lagoons: release of leachate to groundwater, surface water, and surface sediments; and the release of PCB-contaminated residuals/soils to surface water by erosion, surface run-off, and berm failure.

The major components of the selected remedy include:
Excavation of PCB-contaminated soils, sediments, and residuals from the berms, the KSSS floodplain, the five former lagoons, and the Kalamazoo River directly adjacent to the KHL. Excavated soils, sediments, and residuals containing PCBs will be consolidated in Cell 4 of the KHL prior to construction of the cover.

The construction of a cover (cap) over the landfill will minimize infiltration of precipitation through the landfill and prevent potential migration of PCB from the landfill into the Kalamazoo River. The cap will also prevent exposure to the PCBs. The cap is designed to meet the Michigan Solid Waste Landfill closure regulations pursuant to Part 115, Solid Waste Management, of the Michigan Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA). The cap consists of the following components from bottom to top:

- At least a six-inch thick, select granular fill, gas venting layer will be placed on top of the residuals. This gas venting layer is designed to collect landfill gas and route it to the passive venting system. Select granular fill from an off-site source, having a minimum hydraulic conductivity of 1×10^{-3} centimeters per second, will be used to construct the layer. The gas venting system will consist of 19 passive gas vents placed in the select granular fill. Excessive gas generation is not anticipated due to the type and age of the residuals.

- At least a 30-mil thick polyvinyl chloride (PVC) geomembrane liner (barrier layer) will be placed over the select granular fill. The PVC geomembrane liner will act as a barrier to minimize infiltration of precipitation into the residuals.

- At least a 24-inch thick general fill layer (protective layer) will be placed above the 30-mil PVC geomembrane liner. The protective layer will be capable of sustaining the growth of non-woody plants, will have adequate water holding capacity, and will be sufficiently thick to allow for erosion losses. The water that accumulates within this layer will drain to a ditch or a sedimentation outlet structure and subsequently discharge into the Kalamazoo River.

- At least a six-inch thick vegetative layer (erosion layer) will be placed over the protective layer. The erosion layer has been designed to promote vegetative growth, provide surface water runoff, and minimize erosion.

- Erosion protection will be placed on the berms of the landfill. This protection will be sufficient to protect the berms from a 100-year flood event. Part of this erosion protection will be provided by a steel sheet piling stabilization wall present between the Kalamazoo River and the berms of Cells 1 and 2. This wall extends 1020 feet and is located on the north side of the landfill. It extends from the most northern point of Cell 1, southeast along the perimeter of Cells 1 and 2, to the junction where the corners of Cells 2, 3, and 4 meet.

- Groundwater monitoring wells will be installed and wells that are no longer needed will be abandoned.

- Groundwater and surface water monitoring shall be performed for at least 30 years following landfill capping. Monitoring of the groundwater aquifer under the landfill will be conducted in accordance with Parts 115, Solid Waste Management, and 201, Environmental Remediation, of the NREPA, and TSCA (761.75(b)(6)) at a minimum. Monitoring of the surface water and sediments will be conducted in accordance with TSCA (761.75(b)(6)) at a minimum to assess the effectiveness of the remedy.

- Deed restrictions limiting future land use will be imposed at the KHL-OU 3.

- Access restrictions, including enclosing the entire KHL-OU 3 and the five former lagoons with a fence, will be implemented.

- A permanent marker will be placed at the KHL-OU 3 and warning signs will be posted on the fence every 500 feet and on all entry gates.

Statutory Determination

The Michigan Department of Environmental Quality (MDEQ) has concluded that the selected RA is protective of human health and the environment. The United States Environmental Protection Agency (EPA), through its concurrence with this ROD, agrees with the MDEQ's conclusion. The selected RA complies with federal and state requirements that are legally applicable or relevant and appropriate to the RA. Through this concurrence with this ROD, the Regional Administrator of the EPA has determined that a waiver of certain chemical waste landfill requirements under the Toxic Substances Control Act is appropriate for the RA selected in this ROD. This remedy utilizes permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable for the KHL-OU 3 and five former lagoons. This remedy does not satisfy the statutory preference for remedies that reduce the toxicity, mobility, or volume as a principal element because treatment of the principal threats of the KHL-OU 3 was not found to be practicable.

A review will be conducted within five years after commencement of the RA to ensure that the remedy continues to provide adequate protection of human health and the environment because this remedy will result in hazardous substances remaining on-site above health-based levels.

David Ullrich, Acting Regional Administrator
United States Environmental Protection Agency

2/10/98
Date

Russell J. Harding, Director
Michigan Department of Environmental Quality

10/1/97
Date

TABLE OF CONTENTS

TABLE OF CONTENTS (continued)

I. DECISION SUMMARY

A. SITE LOCATION AND DESCRIPTION

The King Highway Landfill-Operable Unit 3 (KHL-OU 3) and the Georgia-Pacific former lagoons 1, 2, 3, 4, and 5 (five former lagoons) of the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund site (site) are the subject of this Record of Decision (ROD). The King Highway Landfill (KHL), the King Street Storm Sewer (KSSS) floodplain, and the adjacent Kalamazoo River are included in the KHL-OU 3. The site is located in Kalamazoo and Allegan Counties, Michigan. The site includes three miles of Portage Creek, from Cork Street to its confluence with the Kalamazoo River, and 80 miles of the Kalamazoo River, from Morrow Lake Dam downstream to Lake Michigan. Also included in the site are five paper residual disposal areas and five paper mill properties. Paper residuals (residuals) are the waste material produced by the paper mill during the paper making process. The five disposal areas have been organized into the following four Operable Units (OUs) of this site:

OU 1: Allied Paper Property/Bryant Mill Pond
OU 2: Willow Boulevard/A-Site
OU 3: King Highway Landfill
OU 4: 12th Street Landfill

The KHL-OU 3 is located in the city of Kalamazoo, Kalamazoo Township, Kalamazoo County, Michigan. More specifically, it is located in the north half of the northeast quarter of Section 23, Township 2S, Range 12W. The KHL-OU 3 is bordered immediately on the south by King Highway (M-96), on the west by the Grand Trunk Railroad right-of-way, and the KSSS floodplain, and by the Kalamazoo River on the north and east sides. The five former lagoons are located on the Georgia-Pacific mill property, directly north of the KHL-OU 3, across the Kalamazoo River (see Figure 1). The Kalamazoo River flows in a westerly direction and is a major tributary to southern Lake Michigan.

The soils, sediments, water column, and biota at the site are contaminated with Polychlorinated Biphenyls (PCBs), a hazardous substance and probable human carcinogen. Based on studies conducted between 1972 and 1989 it has been estimated that there are well over 300,000 pounds of PCBs in the sediments and soils of, or adjacent to, Portage Creek and the Kalamazoo River portions of this site. The KHL-OU 3 and the five former lagoons are both locations which contain PCBs and are considered to be a current ongoing source of PCBs to the Kalamazoo River. The PCBs continue to migrate from the KHL-OU 3 and the five former lagoons into the environment and off-site due to the erosion caused by river flow and surface water run-off. This contributes to the ongoing contamination of the soils, sediments, water column, and biota of the site (i.e. the Kalamazoo River) and Lake Michigan. The Michigan Department of Community Health has issued a species specific no consumption fish advisory annually since 1977 for the

Kalamazoo River portion of this site due to the PCB contamination. The Kalamazoo River and Portage Creek have been designated a site of environmental contamination under Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA), due to PCB contamination. The Kalamazoo River and Portage Creek have been identified as an Area of Concern by the International Joint Commission on the Great Lakes due to the detrimental impact the release of PCBs have on Lake Michigan. Due to the PCB contamination, in August 1990 the site was placed on the National Priorities List (NPL) in accordance with the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), 1980 PL 96-510 as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986 also known as Superfund.

The floodplains, wetlands, and river corridor of the Kalamazoo River and Portage Creek provide habitat for numerous important fish and aquatic species, semi-aquatic species, and terrestrial species. Species of special concern at the site are mink and bald eagles due to their sensitivity to PCB contamination. The Kalamazoo River, downstream of the KHL-OU 3 and the five former lagoons, flows through the Kalamazoo River Nature Center and the Allegan State Game area. The river is a critical natural resource for southwest Michigan providing recreational opportunities such as fishing, hunting, trapping, bird watching, boating, and swimming.

The river also provides recreational opportunities for hiking and biking along the extensive trail systems on the banks of the river. Plans have been made to extend the river trail system along the area where the KHL-OU 3 is located. Residents and visitors to the area enjoy wetland and woodland habitats which support numerous species of plants, birds, reptiles, amphibians, and mammals.

The KHL was originally a series of lagoons used by the Kalamazoo Paper Company to dewater the underflow of the paper mill's primary clarifier located on the north side of the river. Prior to the construction of the King Highway lagoon system, this area consisted of floodplains, wetlands, and a former oxbow of the Kalamazoo River. According to an evaluation of the National Wetlands Inventory Maps during the Remedial Investigation (RI), all the former wetlands within the landfill area have been eliminated by past landfilling activities. The entire KHL-OU 3 is located in the 100-year floodplain of the Kalamazoo River. However, the height of the KHL berms extend above the 100-year flood elevation.

The land immediately adjacent to the south and southwest sides of the KHL-OU 3 is classified for industrial or secondary commercial use. The Kalamazoo River and an associated mix of non-forested shrub or central hardwood deciduous forested lands are located directly east, north, and northwest of the KHL-OU 3. Across the Kalamazoo River to the north lies the Georgia-Pacific Corporation, Kalamazoo Paper Mill and the five former lagoons. The KHL-OU 3 is located east of Riverview Park, formerly Sutherland Park, and Red Arrow Golf Course. South of the landfill, on the other side of M-96, is a city of Kalamazoo salt storage facility and parking lot area for road work and

snow removal equipment. Superior Metal Shredder, Inc./Superior Salvage Co./Superior Industrial Waste Disposal Service lies to the southwest. In close proximity are two residential neighborhoods located approximately 1,100 feet to the west in the city of Kalamazoo and 1,200 feet to the southeast in Kalamazoo Township.

The KHL covers 23.2 acres and consists of four Cells. The total volume of residuals in the KHL is estimated at 282,000 cubic yards. Cells 1, 2, and 3 were permitted under Michigan Solid Waste regulations as a landfill and are nearly filled to capacity. These Cells have a total area of 12.3 acres. Cell 4 covers 3.1 acres and contains 12,700 cubic yards of residuals and is not filled to capacity. Cell 4 was never permitted as part of the landfill. The majority of the residuals in Cell 4 are submerged in a pond formed by the transport of water from the other three cells to Cell 4 through culverts in the dikes. The four cells are separated by dikes approximately 10 to 20 feet high. These dikes were constructed of sand and gravel in the 1950s. They have been "topped" with gravel and are used as access roads. Access roads and non-fill areas compose 7.9 acres in the KHL.

In addition to the four Cells of the KHL, PCB-contaminated sediments, soils, and residuals located on the berms, in the KSSS floodplain, in the Kalamazoo River directly adjacent to the KHL, and in the five former lagoons at Georgia-Pacific Corporation are addressed by this ROD (see Figure 1). The Kalamazoo River is located immediately north and east, while the KSSS floodplain is located immediately to the west of the KHL. The five former lagoons owned by Georgia-Pacific Corporation are located on the north side of the Kalamazoo River next to the paper mill clarifier. These former lagoons were used historically to dewater the underflow from the paper mill clarifier. The estimated volumes of PCB-contaminated materials located in the KSSS floodplain and the five former lagoons are 1,000 and 3,000 cubic yards, respectively. These areas contain PCB-contaminated floodplain soils, sediments, and residuals that will be excavated and consolidated into Cell 4 prior to the placement of the cap.

The geology immediately underlying the KHL is composed mostly of glacial sand and gravel deposits with traces of clay and silt. These glacial deposits have been extensively reworked by the Kalamazoo River. Bedrock, consisting of Coldwater Shale deposited in the Mississippian period of the Paleozoic Era, lies approximately 50 to 70 feet below the land surface. The RI indicates that there is a layer of clay, or sand and clay, approximately 15 feet below ground surface.

Beneath the landfill, the direction of groundwater flow is normally north-to-northwest toward the Kalamazoo River. The groundwater horizontal gradient ranges from 0.0014 to 0.0006 feet/feet. The gradient and flow direction are influenced by the Kalamazoo River.

B. SITE HISTORY AND ENFORCEMENT ACTIVITIES

Carbonless copy paper manufactured between 1957 and 1971 contained Aroclor 1242 (A1242) as an ink carrier or solvent. The A1242 was used as a solvent for certain dyes that were encapsulated in small spheres and applied to one side of the paper during the

coating process. The walls of the spheres consisted of a gelatin-gum arabic formulation which ruptured and released the dye when subject to pressure. The average A1242 content in a sheet of carbonless copy paper was 3.4 percent.

From 1957 to 1971 about 44,162,000 pounds of A1242 were used in the production of carbonless copy paper across the country. This amount accounted for an estimated 28 percent of all the PCBs that the Monsanto Chemical Company (the sole domestic producer of PCBs) sold for plasticizer applications during this period, and 6.3 percent of Monsanto's total domestic PCB sales for those 15 years.

Approximately 19 percent of carbonless copy paper was recycled across the country in 1976 and a greater proportion may have been recycled in previous years. Assuming an average recycling effort of 20 percent for this paper over the 15-year period when PCBs were in carbonless copy paper, then recycled paper streams across the country contained 20 percent of the 44 million pounds of PCBs used in carbonless copy paper, a total of some 8.8 million pounds of PCBs in recycled paper pulp and effluents over 15 years.

The PCBs in the carbonless copy paper that the Georgia-Pacific Corporation, Kalamazoo Paper Mill deinked and repulped either became integrated into new paper products or became part of the paper mill's waste stream. The process of deinking and subsequent pulping of the recycled stock broke the spheres containing the PCB-laden dyes in the paper. These PCBs were then distributed throughout the paper recycling process, including the waste stream. However, some of the PCBs in the carbonless copy paper remained in the recycled pulp and subsequently were incorporated into new paper products. For example, PCB concentrations as high as 433 milligrams/kilogram (mg/kg) were measured in paperboard used for cereal packaging in 1971. Although PCB use in the manufacturing of carbonless copy paper was discontinued in 1971, the paper recycled by the Georgia-Pacific Corporation, Kalamazoo Paper Mill likely continued to contain PCBs for several years after 1971.

The Georgia-Pacific Corporation, Kalamazoo Paper Mill deinked office waste paper which contained carbonless copy paper at two mills during the 15-year period when PCBs were in the paper. Originally, the facility consisted of five mills, three for making paper products, and two for finishing and converting. Mills 1 and 3 both performed deinking operations starting in the early 1950s. Mill 3 discontinued deinking in the late 1960s, was refurbished, and resumed operations in 1975. Mill 1 deinked continuously until the late 1970s. Raw paper waste from all the mills was routed to a clarifier. The clarifier effluent was pumped directly into the Kalamazoo River (i.e., the site) until 1964 when it was rerouted to the city of Kalamazoo Wastewater Treatment Plant.

The underflow from the clarifier was dewatered and disposed of at various locations over the years. From the mid-1950s until the late 1950s the residuals were placed in the original five former lagoons next to the primary clarifier on the mill property. In

the late 1950s residuals were sent to the King Highway lagoons, which later became the KHL, on the south side of the Kalamazoo River for dewatering. The original five dewatering lagoons were then used as an emergency backup system.

Georgia-Pacific Corporation dewatered residuals in the King Highway lagoons until 1977. Some of the dried residuals from the King Highway lagoons were excavated and disposed of at the Willow Boulevard disposal area, another OU of the site, until 1975. By 1975 the Willow Boulevard disposal area was filled to capacity, and Georgia-Pacific Corporation purchased the A-Site disposal area, another OU of the site, from Allied Paper, Inc. Some of the residuals from the King Highway lagoons were excavated and disposed of at the A-Site disposal area. Georgia-Pacific Corporation used the A-Site disposal area for disposal of residuals from 1975 until 1987.

The King Highway lagoons were granted a landfill construction permit by the Michigan Department of Environmental Quality (MDEQ) in June 1982. The King Highway lagoons became the KHL and Cells 1, 2 and 3 were first granted an operating permit by the MDEQ in 1983 under what is now Part 115, Solid Waste Management, of the NREPA as a solid waste landfill. It is still a licensed solid waste landfill. It should be noted that although Cell 4 contains residuals, it was never licensed as a solid waste landfill. Most of the residuals present in Cell 4 were disposed of by Georgia-Pacific prior to Cells 1, 2, and 3 being licensed. However, some of the residuals were transported to Cell 4 in storm water runoff from Cells 1, 2, and 3. Starting again in 1987 Georgia-Pacific Corporation used the KHL for the disposal of dewatered residuals. When active, the cells were being filled from west to east at a rate of about 150 cubic yards per day.

The MDEQ conducted a routine surface water and biota sampling of the Kalamazoo River mouth during 1970. The results of this investigation indicated that the river was discharging PCBs into Lake Michigan. During a biological survey conducted by the MDEQ in 1971, pursuant to a Federal Water Pollution Control Agency program to monitor tributaries of Lake Michigan, it was determined that PCBs in the Kalamazoo River were continuing to discharge to Lake Michigan and were bioavailable.

Using the existing data for the site, the MDEQ scored the site following the CERCLA Hazard Ranking System. The scoring package was proposed to the United States Environmental Protection Agency (EPA) on May 5, 1989, and the site was nominated to the NPL. On August 3, 1990 the site was officially placed on the NPL and was designated a Superfund site.

The Potentially Responsible Party (PRP) search conducted in 1990 identified three PRPs for the PCB contamination of this site. These three PRPs, HM Holdings, Inc./Allied Paper, Inc., Georgia-Pacific Corporation, and Simpson Plainwell Paper Company, were notified of their status on June 23, 1990. More recent efforts on the part of the three initial PRPs to determine other PRPs, have identified the James River Paper Corporation.

Since 1994 the James River Corporation has participated as a PRP on this site. These four parties have been identified as PRPs due to past paper mill operations involving the recycling and deinking of office waste paper that included carbonless copy paper during the period from 1957 to at least 1971. In accordance with Part 31, Water Resources Protection, of the NREPA and CERCLA, on December 28, 1990, the liable parties signed an Administrative Order by Consent (AOC) with the state of Michigan and agreed to fund and conduct the Remedial Investigation/Feasibility Study (RI/FS) for the site. The RI/FS for the KHL-OU 3 was initiated in July 1993, completed by December 1996, and has been placed in the Administrative Record.

C. COMMUNITY PARTICIPATION

The Responsiveness Summary in Section L discusses the involvement of the community during the RI/FS and remedy selection process and demonstrates that the public participation requirements of Sections 113 (k) (2) (i-v), and 117 of CERCLA have been met at the KHL-OU 3 and the five former lagoons. The decision is based on the Administrative Record.

D. SCOPE AND ROLE OF KHL-OU3 WITHIN THE SITE STRATEGY

The MDEQ and the EPA have identified the human health and ecological threat at the KHL-OU 3 and the five former lagoons to be the PCB-contaminated paper residuals, soils, and sediments in and adjacent to the KHL-OU 3 and the five former lagoons. The purpose of this ROD is to select the final remedial action (RA) for the KHL-OU 3 and the five former lagoons of the Allied Paper, Inc./Portage Creek/ Kalamazoo River site. This ROD addresses only the KHL-OU 3, and the five former lagoons within the site. Remedy selection for the other three OUs, Portage Creek, and the Kalamazoo River will be addressed by other RODs. This final remedy is a source control remedy, which contains or controls PCB contamination from the landfill, five former lagoons, contaminated soils, sediments or paper residuals, and the potential release of leachate. The remedy addresses all media including contaminated paper residuals, soils, sediments, and migration pathways considered to represent an unacceptable risk of release to both surface water and river sediments. The ROD for the KHL-OU 3 and the five former lagoons will be consistent with the final remedy for the site.

This remedy does not include treatment that would reduce toxicity, mobility, or volume as a principal element. Although incineration was evaluated as a treatment option, the volume of the waste, implementation time, and the technical and administrative difficulties associated with implementation and cost made it prohibitive. Available information on the landfill operations indicate that it would not be feasible to attempt to locate concentrated areas of PCBs (hot spots) because PCBs are spread evenly throughout the landfill. Therefore, alternatives were not evaluated for location and treatment or removal of hot spots in the KHL-OU 3 or the five former lagoons. As required by the National Contingency Plan (NCP), a periodic (five year) review of the remedy effectiveness will be performed.

Under the existing AOC, interim measures have been required to mitigate threats of potential berm failures due to wind and water erosion damage. A 1,020 feet long steel retaining wall has been constructed to stabilize a portion of the berm and control erosion on the north side of the KHL.

E. SUMMARY OF SITE CHARACTERISTICS

Based upon the information available to the MDEQ, the KHL is a mono-fill of paper residuals with an estimated total volume of 282,000 cubic yards. PCBs are the primary constituent of concern at the KHL-OU 3 and the five former lagoons. PCBs are oily liquids, clear to light yellow in color, and have no smell or taste. PCBs are hazardous substances and are carcinogenic. Characteristics of PCBs that cause them to be especially persistent in the environment are that they bind strongly to soils, do not dissolve well in water, are not easily broken down, and are lipophilic and therefore have an affinity for the fatty tissue of biota which causes them to bioaccumulate.

The PCBs at the KHL-OU 3, the five former lagoons, and the site are closely associated with the fine gray, kaolinite clays and wood fibers that compose the paper residuals. These residuals containing PCBs were disposed of in the KHL-OU 3 starting in 1957 and were part of a waste stream produced by the recycling of office waste paper. This office waste paper contained several types of paper, including the carbonless copy paper which contained PCBs. The recycling of paper, including deinking at the paper mill, resulted in the discharge of PCBs to the river either by the discharge of effluents or by sludge disposal in disposal areas adjacent to the river. The KHL is one of these disposal areas. The presence of these residual disposal areas on Georgia-Pacific Corporation's property, adjacent to the Kalamazoo River, is a direct result of waste treatment systems operated at their paper mill.

The RI at the KHL-OU 3 was conducted in 1993. Based upon public comment on the Proposed Plan some additional data was collected on the groundwater and the residuals in Cell 4. As a result of the RI, it was concluded that KHL-OU 3 and the five former lagoons on the north side of the Kalamazoo are sources and potential sources of PCB contamination to the Kalamazoo River and its floodplain in the vicinity of the KHL-OU 3 and the five former lagoons.

PCB contamination exists in the residuals in and around the landfill and the five former lagoons. In Cells 1, 2, and 3 the PCB concentrations generally increase with depth. The maximum PCB concentration found in the top 16 feet of residuals in Cells 1, 2 and 3 was 8.8 mg/kg. Concentrations over 50 mg/kg were detected at depths of 16 to 30 feet. The maximum concentration in the residuals is 310 mg/kg. However, PCB concentrations in the top eight feet of residuals in Cell 4 are as high as 69 mg/kg. The reason for the difference between Cells 1, 2, and 3 and Cell 4 is that Georgia-Pacific Corporation continued to dispose of residuals at the KHL after the use of PCBs in the manufacture of carbonless copy paper was halted. Tests of residuals that were recently added to the

landfill did not detect PCBs with the exception of one sample in 1987 that contained 6.5 mg/kg PCBs. The soils below the KHL have a maximum PCB concentration of 9.9 mg/kg. Soil borings taken from the KSSS area immediately west of the KHL showed PCB levels in the range of 0.37 to 99 mg/kg. The maximum PCB concentration found in the berms was 77 mg/kg.

Groundwater flows across the KHL to the Kalamazoo River with a horizontal gradient that averages 0.0004 feet/feet. PCBs were not detected in groundwater. However, PCBs were detected in a leachate sample collected from Monitoring Well 10R at a concentration of 1.4 µg/L (micrograms per liter).

One surface water sample was collected from the pond in Cell 4 and analyzed for PCB. The analytical results show a PCB concentration of 0.026 µg/L.

Five surficial residual samples collected in Georgia-Pacific Corporation's five former lagoons detected PCB concentrations in the range of 0.2 to 110 mg/kg. PCBs were detected in three subsurface residual samples in the former lagoons at concentrations from 3.4 to 70 mg/kg. Five soil samples from below the lagoons contained PCB levels in the range of 0.043 to 2.9 mg/kg.

F. SUMMARY OF SITE RISKS

Estimated Human and Ecological Risks if Current Conditions at the KHL-OU 3 and Five Former Lagoons Continue in the Future:

A Baseline Risk Assessment (BRA) to evaluate risks to human health and the environment under current, unremediated conditions was conducted. A number of pathways were screened from the quantitative evaluation based on qualitative screening and the assumption that exposure scenarios could not be assigned a probability of occurrence in the foreseeable future due to restrictions presented in Part 115, Solid Waste Management, of the NREPA and the assurances by the Georgia-Pacific Corporation that the landfill would be closed in accordance with Part 115, Solid Waste Management, of the NREPA. The land use restrictions will be permanent under Part 115, Solid Waste Management, and Part 201, Environmental Remediation, of the NREPA. Because the waste is identical (i.e., waste was generated from the same source at similar concentrations), the routes of exposure are the same, and the receptors are the same at the KHL-OU 3 and the five former lagoons, the MDEQ has determined that the BRA for the KHL-OU 3 is applicable to the five former lagoons.

The pathways which were not evaluated quantitatively in the BRA include the use of groundwater, ingestion of and dermal contact with Kalamazoo River water and sediments, ingestion of biota, and inhalation of constituents released to air from surface/soil residuals by nearby residents, trespassers, and anglers.

The land use restrictions required by Part 115, Solid Waste Management, and Part 201, Environmental Remediation, of the NREPA will prohibit residential use of the KHL in the future. Based upon this information it was not necessary to quantitatively evaluate the future residential scenario for the KHL-OU 3 or the five former lagoons. This includes the possibility of using the groundwater under the KHL and the five former lagoons as a potable water source.

Groundwater, which is discharged to the river, is not used as a potable water source either on-site or downgradient of the KHL-OU 3. Since residential use will be restricted on the KHL-OU 3 as a condition of the Part 115, Solid Waste Management, of the NREPA permit, and as a condition of closure under Parts 115, future installation of potable wells is effectively precluded. Although PCBs were detected in leachate from one well, they were not detected during the RI groundwater sampling or in the previous landfill permit groundwater monitoring.

Ingestion of, and dermal contact with Kalamazoo River water, sediments, and ingestion of biota were not evaluated quantitatively. The sampling results for the KHL indicate that as long as the berms remain intact, the potential impact from the PCBs inside the KHL on surface water quality can be prevented. In particular, the low concentrations of PCBs in the leachate, the lack of detection of PCBs in groundwater, the low hydraulic gradient (0.0004), and low permeability of the residuals all lead to the conclusion that impacts on surface water should be limited if the primary migration pathways continue to be controlled. The present primary migration pathways for the release of PCBs into the river are erosion of residuals from the berms and floodplains and the five former lagoons. The largest potential risk and migration pathway is the release of PCB-contaminated residuals due to failure of the landfill berms. The risks from PCB contamination already existing in Kalamazoo River water, soils, residuals, sediments and biota will be assessed in other OU's.

Inhalation by nearby residents of constituents released to the air from surface soil and residuals was not evaluated quantitatively due to studies which demonstrated it to be insignificant. During the RI, an air monitoring program was conducted at two other OUs of the site (Willow Boulevard/A-Site and Allied Paper, Inc.). Emissions were found to be in compliance with Part 55, Air Pollution Control, of the NREPA. Given that the KHL-OU 3 has lower concentrations of PCBs in surface soils than the two test OUs, and that the distance to the nearest receptor is greater, risks associated with hypothetical, off-site exposure via inhalation was considered negligible.

1. Human Health Risks

Based on the environmental setting of the KHL-OU 3, issues regarding the movement of constituents on-site (i.e., on the KHL-OU 3), and potential for transport off-site (i.e., off the KHL-OU 3), the exposure pathways that are currently possible in association with the OU include:

Incidental ingestion and dermal contact with surface soil/residuals by on-site workers, especially bulldozer operators.

Inhalation of airborne particulates by on-site workers.

Dermal contact with surface water in Cell 4 by on-site workers.

Incidental ingestion and dermal contact with surface soil/residuals, and sediments in Cell 4 by trespassers.

Incidental ingestion and dermal contact with residuals along the berms by anglers.

A Hazard Index (HI) approach was used to characterize the overall potential for non-carcinogenic risk associated with exposure to multiple constituents that cause non-carcinogenic health effects. The calculation of an HI in excess of one indicates the potential for adverse health effects. Both pathway-specific and total HIs less than one are estimated for workers, trespassers, and anglers.

Carcinogenic risk is expressed as a probability of developing cancer as a result of lifetime exposure. The EPA's acceptable target range for carcinogenic risk associated with Superfund sites in general is one in ten thousand (1.0×10^{-4}) to one in one million (1.0×10^{-6}) and the MDEQ's target is one in one hundred thousand (1.0×10^{-5}). For all Superfund sites the acceptable risk level is established by the EPA Regional Administrator on a site-by site basis.

Risks associated with constituents detected in soils, residuals, and sediments were evaluated. Based on the environmental setting of the KHL-OU 3, and the likely foreseeable use of the KHL-OU 3, surface soil/residuals, sediments, and water in Cell 4 were determined to be the media of interest at Cell 4 in the BRA. The constituents of concern in these media were PCBs and polychlorinated dibenzodioxin/polychlorinated dibenzofuran (PCDD/PCDF). Therefore, hypothetical risks based on potential exposures to PCB and PCDD/PCDF in surface soil, surface residuals, surficial sediments, and water in Cell 4 were estimated in the assessment. Additional RI work conducted in Cell 4 indicated that the residual PCB concentrations are greater, (an average of 4.9 mg/kg and a maximum of 69 mg/kg) than those used in the risk assessment. Consequently, the risk assessment may underestimate the potential risks at the KHL-OU 3.

On-site workers, trespassers, and anglers are considered the primary receptors of interest. Total cancer risks are 4×10^{-6} for workers, 1×10^{-5} for on-site trespassers, and 1×10^{-4} for anglers. Although exposures associated with failure of the berms have not been quantitatively estimated, it is reasonable to assume that this event would cause additional unacceptable human health and ecological risk. Consequently, the risk assessment recognized that long-term berm stability will be needed to prevent unacceptable human and wildlife exposure to PCBs from the KHL-OU 3.

2. Environmental Risks

The primary habitat in the vicinity of the KHL-OU 3 and the five former lagoons is the Kalamazoo River and associated floodplain, which are immediately adjacent and border the northern, western, and eastern perimeter of the KHL-OU 3. The Kalamazoo River and associated floodplains are immediately adjacent to the south and north of the five former lagoons. The one surface water body within the KHL-OU 3, other than the river, is the pond in Cell 4. The five former lagoons are also surface water bodies. The water cover in the KHL-OU 3 and the five former lagoons is derived from direct precipitation and surface runoff from surrounding areas.

The perimeter berm upslope from the Kalamazoo River is part of the ecosystem encompassed by the Kalamazoo River and floodplain. There are no barriers to prevent fauna movement from the floodplain or river to the KHL-OU 3. This is also true for the five former lagoons on the north side of the Kalamazoo River. The wooded areas of the berms also provide habitat for terrestrial or river wildlife species. According to the National Wetland Inventory map for the Kalamazoo Quadrangle, two wetlands are located within the KHL-OU 3. Results of field reconnaissance for wetland assessment indicate these wetland areas were eliminated by past physical alterations related to licensed landfill activities at the KHL. The Cell 4 area supports emergent wetland vegetation at its southernmost extent and provides habitat for waterfowl species, aquatic organisms, and mammals.

The aquatic and semi-aquatic flora and fauna in the vicinity of the KHL-OU 3 and the five former lagoons are typical of the area. Most aquatic and semi-aquatic wildlife species are generally associated with the adjacent Kalamazoo River and floodplain. The aquatic habitat of the river and floodplain adjacent to the KHL-OU 3 and five former lagoons provide support for development of various life stages of fish, turtles, and amphibians which are associated with the Cell 4 pond and the five former lagoons.

Terrestrial wildlife species which inhabit the KHL-OU 3 are likely limited to small mammals (e.g., mice, squirrels, woodchucks, mink, raccoons, and muskrats) and birds, especially passerines and waterfowl. Because the Kalamazoo area is part of a major migratory flyway route for waterfowl species, Cell 4 may be used as a migratory stopover. The water cover in Cell 4 and the five former lagoons attracts and supports waterfowl throughout the nesting season because water is present year-round and the vegetation surrounding these areas provides adequate cover and materials for nesting. Larger mammals, such as white-tailed deer, also use the KHL-OU 3 as indicated by the deer tracks observed in the residuals. Muskrat dens have been observed in the Cell 4 pond and there is evidence of woodchucks burrowing into the berms of the landfill.

There are no federally-listed endangered or threatened species known to reside within the KHL-OU 3 or the five former lagoons. Because the KHL-OU 3 and the five former

lagoons are sources of PCBs to the rest of the site, it is important to consider all the federally-listed endangered or threatened species that inhabit the entire site. The federally-listed endangered or threatened species known to reside within the site are two turtle species that are considered scarce, one snake that is considered endangered, and bald eagles, which are considered a threatened species that live and nest on the site. There are also four threatened and one scarce plant species.

The potential effects of exposure to PCBs in the Cell 4 pond were evaluated for acute toxicity to crustaceans and insects. The risk assessment assumed that Cell 4 does not support a fish population. However, during the RI fish were observed in Cell 4. Consequently, the risk assessment probably underestimates the potential ecological risk at the KHL-OU 3.

Although the risk assessment does not quantitatively assess the chronic exposure to PCBs of fish, aquatic invertebrates, amphibians (e.g., frogs), and reptiles (e.g., snakes and turtles), it does recognize that these organisms in Cell 4 would bioaccumulate PCBs and pass them up the food chain to other organisms which would feed upon them. These bioaccumulation food chain effects present the greatest potential for ecological and human health exposure and significant risks. This would occur when organisms forage on the organisms from Cell 4 and when the PCBs from the KHL-OU 3 or the five former lagoons are released into the river.

The presence of PCB-contaminated residuals, soils, and sediments in areas outside Cells 1, 2, 3, and 4 of the KHL and the five former lagoons is evidence of past or ongoing releases to the Kalamazoo River. The landfill berms are being eroded by surface water runoff and the continuous flow of the Kalamazoo River. These berms contain residuals that are being exposed and eroded into the Kalamazoo River. The possibility of failure of the berms located between the Kalamazoo River and Cells 1, 2, and 4 of the KHL is a potential threatened release. Some of the potential threatened release from berm failure has been addressed by the construction of a steel retaining wall along the berms of Cells 1 and 2.

Environmental risks identified in the draft Environmental Risk Assessment on the Kalamazoo River associated with PCB exposure at the site, of which the KHL-OU 3 and the five former lagoons are a part, are as follows:

> Sensitive aquatic biota such as invertebrates and fish, are likely to be adversely affected both directly (direct contact) and indirectly (food chain) by PCBs in surface water and streambed sediment.
>
> These effects include mortality, reproductive effects (i.e. failure), decreased populations and growth effects for sensitive species.

- PCB contamination of surface water and streambed sediment indirectly affect sensitive piscivorous predators, such as mink, through consumption of PCB-contaminated prey.

  Impaired reproduction of mink and, ultimately, decreases in mink populations are the observed effects of PCB contamination in aquatic prey.

  Other less sensitive piscivorous predators, such as bald eagles, are at risk if fish are the predominant prey item consumed and if foraging takes place mostly within contaminated aquatic areas. Bald eagles on this site have failed to reproduce for at least the last seven year.

- Terrestrial and semi-aquatic biota are at risk from PCB-contaminated floodplain sediment and surface soil, depending on life history (e.g., foraging behavior, diet, mobility) and sensitivity to PCBs.

  Carnivorous terrestrial species, represented by the red fox, are likely to be at significant risk if foraging is concentrated in riparian areas with PCB-contaminated floodplain sediment and diet consists of prey that reside in PCB-contaminated areas.

  Omnivorous terrestrial species, represented by mice, appear to have moderate potential for risk from PCB-contaminated surface soil/floodplain sediment. These risks would be location-dependent, and would be influenced by diet, season, and mobility of consumers and by the level of contamination of food items.

  Omnivorous birds that consume a substantial amount of vegetation, represented by the robin, may be at risk if consumed terrestrial plants are taken from highly contaminated areas. Consumption of terrestrial invertebrates such as earthworms is expected to contribute substantially less to total PCB intake than ingestion of plants, based on estimated PCB levels in plants and measured PCB concentrations in earthworms.

  Semi-aquatic herbivorous mammals, represented by muskrat, are at risk from PCB contamination because estimated dietary doses exceed recommended threshold values for rats. Muskrats contaminated with PCBs also cause adverse effects to muskrat predators because some muskrats contain PCBs in excess of recommended dietary limits for PCB-sensitive predators such as mink.

Based on the results of the risk assessment for the KHL-OU 3 and the draft Ecological Risk Assessment for the site, the objectives of the RAs must address the following risks:

Human health risks for persons who trespass or work on the KHL-OU 3.

Human health and ecological risks due to past migration of PCBs to the Kalamazoo River and surrounding floodplain areas, and berms from the KHL-OU 3.

Human health and ecological risks due to the continued release of PCBs to the Kalamazoo River, surrounding floodplain areas, and berms from the KHL-OU 3.

Human health and ecological risks due to the potential additional release of PCBs to the Kalamazoo River and surrounding floodplain areas caused by failure of the berms of the KHL-OU 3.

G. DESCRIPTION OF ALTERNATIVES

A total of seven potentially applicable technology types which incorporated 60 different process options were screened with respect to technical implementability at the KHL-OU 3. Based upon this screening, three potentially applicable technology types were chosen as alternatives. The 'No Action' option was evaluated as required by the NCP to provide a baseline for comparison of the effectiveness of the remedial alternatives. Under the No-Action alternative, no active response measures would occur. No reduction of toxicity, mobility, or volume through treatment of the PCBs would be provided by this alternative. Therefore, no risk reduction would result from this action. The No-Action alternative would not meet the applicable or relevant and appropriate requirements (ARARs) and would not be protective. One of these ARARs, Part 115, Solid Waste Management, of the NREPA requires that the closure of KHL-OU 3 meet or exceed the closure requirements for a landfill pursuant to the Michigan Solid Waste regulations (Part 115, Solid Waste Management, of the NREPA). Due to the above factors the No-Action alternative was eliminated by screening in favor of the three potential alternatives listed below.

Alternative 1: Landfill Closure (consolidation, containment and capping in accordance with Part 115, Solid Waste Management and Part 201, Environmental Remediation, of the NREPA).

Alternative 2: Removal and disposal of residuals.

Alternative 3: Removal, treatment, and disposal of residuals.

All cost estimates presented with the following descriptions of the three alternatives are expressed in 1994 dollars and are based on conceptual engineering and design. Capital costs consist of direct costs (e.g., construction, equipment, transportation, disposal, analytical, treatment, and contingency) and indirect costs (e.g., engineering, legal, and permitting fees) incurred by implementing a specific alternative. Operation and Maintenance (O&M) costs refer to long-term, post-construction measures necessary to ensure continued effectiveness of an RA. The O&M costs were developed for the first year of system operation and a 30-year present worth (PW) cost analysis. Total net PW

cost represents the sum of money, if invested in the base year and disbursed as needed, that would be sufficient to cover costs of a remedy over its planned life (assumed to be 30 years for comparison purposes).

Alternative 1: Landfill Closure (consolidation, containment and capping in accordance with Part 115, Solid Waste Management and Part 201 Environmental Remediation, of the NREPA)

Capital Cost:	**$1.6 - $2.7 million**
O&M Cost:	**$125,000 a year**
Net PW Cost:	**$3.2 - $4.3 million (capital and O&M)**
Implementation Time frame:	**1.0 years**

Alternative 1 involves the consolidation and containment of the PCB-contaminated residuals via landfill closure, reinforcement of the existing berms, and long-term monitoring. Closure of the landfill would be in accordance with Part 115, Solid Waste Management, of the NREPA regulations and the landfill's current permit. Reinforcement of the existing berms would increase stability and minimize the potential for berm failure under flood conditions. Long-term monitoring involves the collection and analysis of groundwater and surface water samples to track the effectiveness of the cap. Alternative 1 also includes institutional controls such as fencing, deed restrictions and sign posting to reduce potential human exposure to soil, residuals, and other media.

Alternative 2: Removal and Disposal of Residuals

Capital Cost:	**$55.5 - $66.5 million**
O&M Cost:	**None**
Net PW Cost:	**$55.5 - $66.5 million (capital and O&M)**
Implementation Time frame:	**2.9 years**

Alternative 2 includes the excavation, dewatering, and off-site disposal of all residuals from the KHL-OU 3. Dewatering the residuals would yield a material acceptable for disposal and transport to an off-site commercial landfill. Water obtained from residuals dewatering would be treated on-site to remove any PCBs prior to discharge.

Based on the results of the RI, at least 76,000 cubic yards of residuals contain PCB concentrations greater than 50 parts per million (ppm) and would be regulated for off-site disposal by the federal Toxic Substances Control Act (TSCA), Subpart D of the Code of Federal Regulations (CFR) 40 CFR 761. Such residuals would be disposed at an existing commercial TSCA disposal facility. The 206,000 cubic yards of residuals with PCB concentrations less than 50 ppm would not be regulated by TSCA and could be disposed of at a commercial sanitary landfill.

Following the excavation and disposal of the residuals, the landfill would be graded to match the surrounding area. A minimum 6-inch layer of topsoil with vegetative cover would be installed to minimize erosion to comply with Soil Erosion and Sedimentation Control requirements of Part 91, Soil Erosion and Sedimentation Control, of the NREPA.

The capital costs associated with this alternative are higher than Alternative 1 due to the high cost of off-site disposal of residuals at a TSCA facility (off-site TSCA disposal represents approximately 50 to 70 percent of the total capital cost for Alternative 2).

Alternative 3: Removal, Treatment, and Disposal of Residuals

Capital Cost:	**$55.0 - $426.8 million**
O&M Cost:	**None**
Net PW Cost:	**$55.0 - $426.8 million (capital and O&M)**
Implementation Time frame:	**4.4 years**

Alternative 3 is the same as Alternative 2 with the addition of a treatment step. Residuals with a PCB concentration 50 ppm or greater (76,000 cubic yards) would be treated either on-site or off-site via incineration prior to disposal in a commercial sanitary landfill. The 206,000 cubic yards of residuals containing less than 50 ppm of PCBs would be disposed at a commercial sanitary landfill.

The capital costs associated with this alternative are higher than Alternatives 1 and 2 due to the high cost of incineration (on-site or off-site) of the residuals (incineration represents approximately 50 to 90 percent of the total capital cost for Alternative 3).

H. SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES

In accordance with the NCP, the relative performance of each alternative is evaluated using nine criteria (section 300.430(e)(9)(iii) of the NCP) as a basis for comparison. The alternative which provides the "best balance" with respect to the nine criteria is determined from this evaluation.

1. Threshold Criteria

a. **Overall Protection of Human Health and the Environment** addresses whether a remedy provides adequate protection of human health and the environment and describes how risks posed through each exposure pathway are eliminated, reduced, or controlled through treatment, engineering, or institutional controls. The selected remedy must meet these criteria.

The major exposure pathways of concern at the KHL-OU 3 and the five former lagoons are ingestion of, inhalation of, and dermal contact with PCB-contaminated soils or residuals in the landfill; ingestion of and dermal contact with PCB-contaminated

soils/residuals and sediments in Cell 4; dermal contact with PCB-contaminated surface water in Cell 4; and ingestion of and dermal contact with PCB-contaminated river sediments and soils along the berms. The release of PCB-contaminated residuals from berm, the landfill cells, floodplain, river sediments, or berm failure would result in the bioaccumulation of PCBs and food chain effects which will also be considered in the evaluation of exposure pathways.

Alternative 1 would provide adequate protection of human health and the environment by controlling the mobility of contaminants through engineering and institutional controls. The cap, constructed in accordance with Part 115, Solid Waste Management, of the NREPA along with institutional controls, would serve as a barrier to human and wildlife contact with the residuals. An adequate cap would also decrease the rate of precipitation infiltration, thereby further reducing the potential for PCBs to migrate into groundwater. Stabilization of the berms would prevent release of residuals due to berm failure. Consolidation of residuals from the berms, the KSSS floodplain, the five former lagoons, and the Kalamazoo River into Cell 4 prior to the construction of the cap will reduce the potential for exposure and migration of PCBs into the environment.

Alternative 2 would provide adequate protection of human health and the environment by eliminating the presence of contaminants at the KHL-OU 3 through removal and off-site disposal of PCB-contaminated waste.

Alternative 3 also provides adequate protection of human health and the environment by eliminating the presence of contaminants on-site. The removal and off-site disposal/incineration of PCB-contaminated waste eliminates risks associated with PCBs at the KHL-OU 3.

b. Compliance with ARARs addresses whether a remedy will meet ARARs set forth in federal and state environmental laws and/or justifies a waiver from such requirements.

ARARs of most concern to this remedial action include the following:

- Surface water quality standards in Part 31, Water Resources Protection, of the NREPA.
- Rules established under Part 31, Water Resources Protection, of the NREPA regarding permit requirements.
- Site-specific pollutant limitations and performance standards which are designed to protect surface water quality in the Federal Clean Water Act.
- Regulations prohibiting unauthorized obstruction or alteration of any navigable water in the United States (dredging, fill, cofferdams, piers, etc.) in the Federal River and Harbor Act;
- Regulations on dredging or filling of lakes or stream bottoms found in Part 301, Inland Lakes and Streams, of the NREPA.

- Rules prescribing soil erosion and sedimentation control plans, procedures, and measures found in Part 91, Soil Erosion and Sedimentation Control, of the NREPA.
- Rules regarding construction, operation, and maintenance of sewage systems in Part 41, Sewerage Systems, of the NREPA.
- Rules prohibiting the emissions of air contaminants in quantities which cause injurious effects to human health, animal life, plant life of significant economic value, and/or property found in Part 55, Air Pollution Control, of the NREPA.
- National ambient air quality standards in the Federal Clean Air Act.
- Transportation and handling requirements in the USDOT Placarding and Handling regulations for materials containing PCBs at concentrations of 20 ppm or greater.
- Rules specifying environmental response, risk assessment, RAs and site cleanup criteria in Part 201, Environmental Remediation, of the NREPA.
- Regulations regarding the construction, operation, and closure of sanitary landfills, solid waste transfer facilities, and solid waste processing plants in Part 115, Solid Waste Management, of the NREPA.
- Effluent standards for toxic compounds including PCBs in the Federal Water Pollution Control Act Toxic Pollutant Effluent Standards.
- TSCA disposal regulations at 40 CFR Section 761.60 et seq. are applicable to PCBs at concentrations of 50 ppm or greater when such PCBs are "taken out of service". Under the RAs being considered, TSCA disposal regulations could be triggered by the excavation of PCB-contaminated residuals, sediments and soils from the five former lagoons. These residuals, sediments and soils would be consolidated into Cell 4. Pursuant to 40 CFR Section 761.60 (a) (4), PCBs must be disposed of : "(i) in an incinerator which complies with 761.70; or (ii) in a chemical waste landfill which complies with 761.75." The TSCA compliant chemical waste landfill disposal method is generally much less expensive than incineration.

The on-site consolidation and containment of PCBs, whether from sediments, soils, or residuals excavated from the five former lagoons will be placed in Cell 4. Cell 4, being an existing landfill cell does not possess the following chemical waste landfill requirements found in Section 761.75 (b):

- Bottom liner requirements (the landfill does not have a bottom liner) (761.75 (b) (1) and (2)).
- Hydraulic conditions - fifty foot distance between bottom liner and historical high water table or leachate collection system (761.75 (b)(3)).
- Leachate collection requirements (761.75 (b)(7)).

Pursuant to 761.75 (c) (4), the EPA Regional Administrator may determine that one or more of the requirements in 761.75 (b) is not necessary to protect against unreasonable risk of injury to health or the environment from PCBs and may waive such requirements. In this ROD, the EPA Regional Administrator waives the requirements in 761.75 (b) (1), (2), (3) and (7) because the final RA will provide protection to human health and the environment against unreasonable risks of injury. Also taken into consideration are the following facts: 1.) no significant reduction in long-term risks would be gained from off-site disposal of the relatively small quantity of PCBs in excavated residuals, sediments, and soils as compared to the amount of PCBs being contained in place under the final cover; 2.) PCBs are the only chemical of concern; 3.) the PCB concentrations in the five former lagoons are lower than those already present in the KHL; 4.) the PCB-contaminated residuals were disposed of prior to February 17, 1978; 5.) the residuals originated from the same industrial process waste stream; and, 6.) the leachability of PCBs from the KHL-OU 3 is not likely because of the high PCB affinity for the residuals and the low hydraulic conductivity of the residuals (~ 1 x 10^{-7} cm/sec.).

Alternatives 2 or 3 would be in compliance with state and federal ARARs. These two alternatives would comply with the TSCA disposal requirements of 761.60. Alternative 1 includes the on-site consolidation, containment and capping as described in this ROD and would be in compliance with all state and federal ARARs except TSCA regulations of 40 CFR Section 761.75 (b). With a waiver for the chemical landfill requirements of 761.75 (b), Alternative 1 meets the disposal requirements of 761.60. Alternative 1 would also comply with the existing permit closure requirements of the NREPA because a part of the KHL of the KHL-OU 3 is a permitted solid waste landfill.

2. Primary Balancing Criteria

c. **Long-term Effectiveness and Permanence** refers to expected residual risk and the ability of a remedy to maintain reliable protection of human health and the environment over time once cleanup goals have been met.

Alternative 1 would provide long-term effectiveness via consolidation of residuals from outside the berms and five former lagoons into Cell 4, stabilization of the berms, and isolation of the residuals by capping. Permanence of the remedy would require that long-term operation and maintenance and monitoring will be provided to insure that the remedy maintains its reliability to protect human health and the environment over time.

Alternative 2 would provide long-term effectiveness via removal of residuals and off-site disposal. This alternative provides permanence without any additional actions at the site.

Alternative 3 would provide long-term effectiveness via removal and treatment of residuals. This alternative also provides permanence without any additional actions at the site.

d. **Reduction of Toxicity, Mobility, or Volume Through Treatment** addresses the statutory preference for selection of RAs that employ treatment technologies that permanently and significantly reduce toxicity, mobility, or volume of the hazardous substance as a principal element.

As detailed above, the stated programmatic goal of the EPA, as expressed in the NCP, is to select remedies that are protective over time and "minimize untreated waste" (section 300.430 (a) (1) (i)). The NCP states that the EPA will use "treatment to address the principal threats at a site, wherever practicable" (section 300.430 (a) (1) (iii) (A)). This preference is satisfied when treatment is used to reduce the principal threats at a site through destruction of toxic contaminants, reduction of total mass of toxic contaminants, irreversible reduction in contaminant mobility, or reduction of total volume of contaminated media.

Alternative 3 is the only alternative that would result in the reduction in the toxicity, mobility, or volume of contaminants through treatment. Incineration would destroy the PCBs in the soils, sediments and residuals. Approximately 76,000 cubic yards of residuals with PCB concentrations equal to or greater than 50 ppm would be treated on-site or off-site via incineration prior to disposal in a commercial sanitary landfill. The remaining 206,000 cubic yards of residuals containing PCB concentrations less than 50 ppm would also be disposed of in a commercial sanitary landfill.

e. **Short-term Effectiveness** considers the time to reach cleanup objectives and the risks an alternative may pose to site workers, the community, and the environment during remedy implementation. This criterion also considers the reliability and effectiveness of any mitigative measures taken during remedy implementation to control those short-term risks.

Alternative 1 has some potential short-term negative impacts. Capping is a standard engineering process and standard safety precautions would be undertaken to reduce the likelihood of accidents during construction. Truck traffic during cap construction may increase noise and dust. Protective controls would need to be in place to suppress dust that contains PCB concentrations so that federal and state air-quality standards are complied with. The use of erosion controls would mitigate short-term effects posed by potential siltation and contaminant release to the Kalamazoo River. Standard health and safety requirements would protect site workers and the community from unacceptable exposures to hazardous substances. The discharge of treated water to the Kalamazoo River or to the Kalamazoo Wastewater Treatment Plant will be in accordance with the substantive requirements of National Pollutant Discharge Elimination System (NPDES) discharge criteria (as administered by the state under Part 31, Water Resources Protection, of the NREPA), which are set at protective levels.

Alternative 1 has the greatest short-term effectiveness since the project could be completed within one year, which is a shorter time period than that for the completion of Alternatives 2 and 3. In comparison, implementation of Alternative 2, which includes the

excavation and off-site disposal of all residuals and the restoration of the former cell areas, would take approximately 2.9 years to complete. Alternative 3, which involves excavation and incineration as a treatment process, has the longest implementation time. This is due to project schedule uncertainties associated with the permitting process, incinerator acquisition, construction and modification, test burn requirements, and trial runs required prior to approval of the treatment technology for the residuals. Excavation, incineration, and off-site disposal of the residuals to be treated and restoration of the former cell areas would take approximately 1.9 years to complete. When considering the uncertainties mentioned above, the time frame of Alternative 3 could increase by 2.5 years to 4.4 years.

Alternatives 2 and 3 would need proper controls so there would be no significant short-term effects on the community or exceedances of standards during implementation due to the projected level of excavation and on-site incineration activity. During the 2.9 years to implement Alternative 2 and the 4.4 years to implement Alternative 3, the air emission, from excavation and on-site incineration of Alternative 3 or the excavation and removal of the residuals of Alternative 2, could cause dust levels in the ambient air to exceed protective standards. For these Alternatives, truck traffic during the removal operations may increase noise and dust. Protective controls would need to be in place to suppress the dust and associated PCB emissions that could be above the federal and state air quality standards to reduce short-term impacts to site workers and local residents. The use of erosion controls would mitigate the short-term effects posed by potential siltation and contaminant release to the Kalamazoo River. Standard health and safety requirements would protect site workers and the community from short-term exposures to hazardous substances. The discharge of treated water to the Kalamazoo River or to the Kalamazoo Wastewater Treatment Plant will be in accordance with the substantive requirements of NPDES discharge criteria (as administered by the state under Part 31, Water Resources Protection, of the NREPA), which are set at protective levels.

f. **Implementability** is the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement a particular option.

No significant implementation problems are projected for Alternative 1. Cap materials are expected to be obtainable from nearby sources and standard construction methods will be used. Hauling cap materials to the KHL-OU 3 may increase the wear and tear on the local roads. Environmental controls will be needed to prevent air emissions to the atmosphere or migration of PCBs to the river during consolidation and cap construction.

Alternatives 2 and 3 meet the implementation criteria stated above. The excavation techniques used for both these Alternatives are generally well proven. However, environmental controls will be needed to prevent the emissions or migration of PCBs to the river and the atmosphere during excavation and on-site incineration. Material handling problems and mechanical breakdowns could slow the treatment progress. Also, based on the restricted availability of mobile incineration units (six to twelve month lead time may be required for scheduling purposes) and the testing required for agency

approval, the implementability of Alternative 3 may be more difficult. Public acceptance of on-site incineration may also be a hindrance to the implementation of Alternative 3.

g. Cost includes estimated capital and O&M cossts, also expressed as net present worth.

Table 2
Estimated cost of Remedial Alternatives for KHL-OU 3

Alternative	Capital (million)	O & M (per year)	Present Worth (million)
1 (Cap & Contain)	$ 1.6 - 2.7	$125,000	$ 3.2 - 4.3
2 (Removal & Disposal)	$55.5 - 66.5	None	$55.5 - 66.5
3 (Removal, Treatment & Disposal	$55.0 - 426.8	None	$55.0 - 426.8

3. Modifying Criteria

h. **Support Agency Acceptance** addresses whether or not the Support Agency agrees with, or objects to, any of the remedial alternatives.
The EPA, as the support agency for the site, is in agreement with the analyses and recommendations presented in the RI/FS, Proposed Plan and this ROD. The EPA concurs with the selected alternative as presented below.

i. **Community Acceptance** addresses the public's general response to the remedial alternatives and to the Proposed Plan. Specific responses to public comments are addressed in the attached Responsiveness Summary.

I. THE SELECTED REMEDY

In accordance with CERCLA and the NCP, and based upon the evaluation of the RI/FS and the nine criteria, **Alternative 1** has been selected as the method providing overall effectiveness proportional to its cost to adequately protect human health and the environment against exposures to hazardous substances at the KHL-OU 3 and the five former lagoons. The RA for the KHL and the five former lagoons shall meet the limited industrial cleanup criteria set forth in sections 20120(a) and 20120(b) of the NREPA. The RA for the KSSS floodplain which is adjacent to the KHL shall meet the residential cleanup criteria set forth in sections 20120(a) and 20120(b) of the NREPA and the TSCA.

1. Cap
Under Alternative 1, a cap shall be placed on Cells 1, 2, 3, and 4 of the KHL-OU 3 in compliance with the current requirements of Part 115, Solid Waste Management, of the NREPA concerning cap specifications for closure of a solid waste disposal facility. The construction of the cap over the landfill will minimize infiltration of precipitation through

the landfill and prevent continued migration of residuals from the landfill into the Kalamazoo River. The cap consists of the following components from bottom to top.

At least a 6-inch thick select granular fill gas venting layer will be placed on top of the residuals. This gas venting layer is designed to collect landfill gas (methane) and route it to the passive venting system. Select granular fill from an off-site source, having a minimum hydraulic conductivity of 1×10^{-3} cm/s, will be used to construct the layer. The gas venting system will consist of 19 passive gas vents placed in the select granular fill. The venting system shall be monitored to determine whether emissions may cause potential health effects. If potential health effects are indicated, an emission treatment system shall be placed in the venting system to reduce the emissions to acceptable levels. However, excessive gas generation is not anticipated due to the type and age of the residuals.

At least a 30-mil thick polyvinyl chloride (PVC) geomembrane liner (barrier layer) will be placed over the select granular fill. The barrier layer will act as a barrier to minimize infiltration of precipitation into the residuals.

At least a 24-inch thick general fill layer (protective layer) will be placed above the 30 mil PVC geomembrane liner. The protective layer will be capable of sustaining the growth of non-woody plants, will have adequate water holding capacity, and will be sufficiently thick to allow for erosion losses. The water that accumulates within this layer will drain to a ditch or a sedimentation outlet structure and discharge to the Kalamazoo River.

At least a 6-inch thick vegetative layer (erosion layer) will be placed over the protective layer. The vegetative layer has been designed to promote vegetative growth, provide surface water runoff, and minimize erosion. The feasibility of using vegetation that would provide habitat, such as native grasses, will be addressed in the Remedial Design.

2. Erosion Protection

Placement of erosion protection on the berms of the landfill will be in compliance with TSCA section 761.75 (b) (4), and Part 115, Solid Waste Management, of the NREPA. This protection will be sufficient to protect the berms up to two feet above the 100-year flood event. Part of this erosion protection will be provided by a steel sheet piling stabilization wall which was constructed during 1994 and 1996 as an interim action. The 1,020 foot wall was constructed between the Kalamazoo River and the perimeter of Cells 1 and 2 on the north side of the landfill. It extends from the most northern point of Cell 1, southeast along the perimeter of Cells 1 and 2, to the junction where the corners of Cells 2, 3, and 4 meet. Selection of erosion protection for the remaining sides of Cells 1 and 4 will be determined as part of the Remedial Design (RD).

3. Installation of Groundwater Monitoring System
Groundwater monitoring wells will be installed and wells that are no longer needed will be properly abandoned. This groundwater monitoring system will developed in RD.

4. Long-Term Monitoring
Groundwater and surface water monitoring shall be performed for at least 30 years following landfill capping. Monitoring of the groundwater aquifer under the landfill will be conducted in accordance with Parts 115, Solid Waste Management, and 201, Environmental Remediation, of the NREPA, and TSCA (761.75(b)(6)) at a minimum. Monitoring of the surface water and sediments will be conducted in accordance with TSCA (761.75(b)(6)) at a minimum to assess the effectiveness of the remedy.

5. Consolidation
The PCB-contaminated residuals, soil, and sediments from the berms and the adjacent floodplains of the KSSS will be consolidated into Cell 4 of the KHL. Verification sampling will be conducted, and if the MDEQ's unrestricted residential cleanup criteria of 1.0 parts per million is achieved, the action will be accepted as a final remedy. If this criteria is not achieved, the PRPs will propose, within 45 days, specific additional actions, including an implementation schedule, that will be taken to achieve any of the appropriate state cleanup criteria.

PCB-contaminated residuals and sediments from the adjacent Kalamazoo River will be consolidated into Cell 4 of the KHL as an interim response action using visual criteria. The focus of this action will be to consolidate residuals at the toe of the berms back into Cell 4.

PCB-contaminated residuals and soils from the Georgia-Pacific five former lagoons will also be consolidated into Cell 4 as a final remedial action with a cleanup criteria for PCBs of 21 ppm. Land use restrictions will be imposed and recorded with the register of deeds. Verification sampling will be conducted to determine if the limited industrial cleanup criteria of 21 ppm has been achieved. Upon completion of the excavation the five former lagoons will be backfilled with clean soil. Soil erosion control measures will also be implemented.

6. Institutional Controls - Fencing
Institutional controls will be relied upon to provide additional effectiveness to the remedy. A fence shall be installed around the entire KHL and the five former lagoons to restrict access. This shall be installed as part of the RA.

7. Posting and Permanent Marker
As required by Part 201, Environmental Remediation, of the NREPA, a permanent marker will be placed at the KHL describing the restricted area of the KHL-OU 3 and the nature of any restrictions. Warning signs will also be posted on the fence every 500 feet and on all entry gates. Construction details shall be part of the RD.

8. Deed Restrictions

Deed restrictions shall be placed on the landfill area property to regulate the future use of the KHL-OU 3.

9. Long-Term Maintenance

Long-term maintenance and post-closure care will be provided. Detailed plans shall be part of the Remedial Design.

10. Financial Assurance Mechanisms (FAM)

Financial Assurance will be established by the PRPs in accordance with Part 201, Environmental Remediation and Part 115, Solid Waste Management, of the NREPA. The Financial Assurance mechanism will insure that there are funds available to pay for monitoring, operations and maintenance, oversight, and other costs determined by the state to be necessary to assure the effectiveness and integrity of the remedial action. If the U.S. EPA conducts the action this FAM will not be necessary.

11. Other Provisions

Mitigative measures will be taken during remedy construction activities to minimize the noise and dust impacts of construction upon the surrounding community. Fugitive dust emissions shall not violate the National Ambient Air Quality Standards for emissions of particulate matter smaller than 10 microns or the standards contained in Part 55, Air Pollution Control, of the NREPA.

12. Five Year Review

A review will be conducted within five years after commencement of the RA to ensure that the remedy continues to provide adequate protection of human health and the environment because this remedy will result in hazardous substances remaining on-site above health-based levels.

13. Significant Modifications to the 1994 Proposed Plan and the 1997 Revised Proposed Plan

The revised Proposed Plan released in July 1997 presented the all following modifications to the preferred alternative with the exception of the change in the unlimited residential criteria.

a. Changing gabions to steel sheet pilings

The erosion control and berm stabilization system has been changed to steel sheet piling from the rock filled wire baskets called gabions that were originally proposed. Both of these options were reviewed in the FS. The steel sheet piling was selected because of site-specific advantages it has over gabions discussed below.

During a storm in 1994 the berm was damaged when several trees were uprooted. This left a 120 foot section of the berm vulnerable to erosion and failure. For this small section of berm an interim response action was necessary to prevent berm failure. The sheet piling could be quickly and cost-effectively implemented to stabilize this section of

berm. Also, there was a greater degree of confidence that the installation of the sheet piling could be properly constructed and would result in fewer construction impacts on the river than gabions. Review of the berm conditions to either side of the sheet piling indicated that installation of another 900 feet of sheet piling as an interim action would further stabilize the berm and be consistent with the final remedy.

The sheet piling was driven 20 feet into the ground to stabilize the base of the berm. The retaining wall was extended two feet above the 100-year flood elevation, 765.5 feet above sea level, to prevent surface water runoff from eroding residuals and soils into the Kalamazoo River and protect the berm and the KHL-OU 3 from severe flood events. During construction, precautions were taken to minimize impacts of the work on the Kalamazoo River. Residuals found on the surface or in the berms were removed and placed in a storage area in Cell 4. Clean material was then placed in this void between the sheet pile retaining wall and the remaining berm. The entire area has been seeded to promote growth of vegetation across the surface.

b. Remediation of Cell 4

Additional investigation of Cell 4 indicated that it contains a greater volume of PCB-contaminated residuals (12,700 cubic yards) than originally estimated, that the PCB concentration was greater than originally estimated (maximum of 69 mg/kg), and that the pond supported numerous species of aquatic life including fish. Based upon the new information the remedial decision was made to cap and contain the residuals in-place. The pond in Cell 4 will be dewatered prior to the construction of the cap.

c. Consolidation of PCB-contaminated residuals, soils and sediments

PCB-contaminated residuals have migrated from the landfill and have contaminated the soils and sediments of the berms, KSSS area, floodplain, and the Kalamazoo River directly adjacent to the KHL-OU 3. The PCB-contaminated residuals, soils, and sediments from these areas will be excavated and consolidated in Cell 4 prior to construction of the cap. There are also five former lagoons on the north side of the river next to the paper mill's clarifier that will be excavated and placed in Cell 4 at the same time. This action will take advantage of the most cost-effective disposal alternative available.

The unlimited residential cleanup criteria was specified in the Revised Proposed Plan was 2.3 ppm. However, this cleanup criteria has been changed to 1.0 ppm due to a change in the absorption factor use to calculate this criteria. This will affect the consolidation of contaminated materials from the KSSS floodplain.

J. STATUTORY DETERMINATIONS

The selected remedy must satisfy the requirements of Section 121 of CERCLA to:

1. Protect human health and the environment
2. Comply with ARARs

3. Be cost-effective
4. Utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable
5. Satisfy the preference for treatment as a principal element of the remedy.

The implementation of Alternative 1 at the KHL-OU 3 of the site satisfies the requirements of CERCLA as detailed below:

1. Protection of Human Health and the Environment

The presence of PCBs in areas outside the KHL berms is evidence of a past or ongoing release of PCBs from the KHL-OU 3. The possibility of berm failure between Cells of the KHL-OU 3 and the Kalamazoo River is recognized as a threatened release of PCBs, a hazardous substance and carcinogen, into the environment. The implementation of the selected alternative will reduce and control potential risks to human health and the environment posed by exposure to PCB-contaminated residuals.

The potential risk caused by exposure to PCBs by workers (4×10^{-6}), on-site trespassers (1×10^{-5}), and anglers (1×10^{-4}) will be reduced by the cap which will provide a barrier that will eliminate the PCB exposure pathways of inhalation, ingestion, and dermal contact. All PCB-contaminated materials with a; concentration greater than or equal to 1 mg/kg from the berms and KSSS, concentration greater than or equal to 21 mg/kg from the former five former lagoons, and all residuals from the Kalamazoo River immediately adjacent to the KHL-OU 3 will be excavated further reducing any exposure pathway for workers, on-site trespassers, or anglers. The dewatering of the pond in Cell 4 prior to capping will again eliminate all exposure pathways associated with the PCB-contaminated surface water at the KHL-OU 3. By eliminating the exposure pathways the alternative effectively reduces the risk to less than 1×10^{-6}. Institutional controls in the form of fencing and posting along with deed restrictions will further reduce the likelihood of any exposure to humans.

To a large extent, the reduction of risk to wildlife from exposure to PCBs at the KHL-OU 3 will be accomplished in the same way. The consolidation of PCB-contaminated residuals, soils, and sediments into Cell 4 and construction of the cap will reduce the exposure pathways. Also, the dewatering of the Cell 4 pond will further reduce the exposure pathways.

The largest potential risk to human health and the environment is from the failure of the berms. This alternative will provide stabilization and erosion protection for the berms to prevent failure. The selected remedy also protects the environment by reducing the potential risk posed by PCBs migrating to the surface water (the Kalamazoo River). Capping the landfill, in addition to reducing any potential further risk posed by exposure to landfill contaminants, will reduce precipitation infiltration through the residuals over time.

No unacceptable short-term risks or cross-media impacts will be caused by implementation of the remedy. The community and site workers may be exposed to noise and dust nuisances during the consolidation and construction of the cap. As mentioned above, mitigative measures will be taken during excavation and construction activities to minimize the noise and dust impacts of construction on the surrounding community.

2. Compliance with ARARs

The selected remedy will comply with the federal and/or state ARARs (categorized as chemical-specific, location-specific, and action-specific) listed below:

a. Chemical-specific ARARs

Chemical-specific ARARs regulate the release of specific substances which have certain chemical characteristics. Chemical-specific ARARs typically determine the extent of cleanup at a site.

Federal Chemical-Specific ARARs:

TSCA:
TSCA establishes the requirements for handling, storage, and disposal of PCB. This is an ARAR for any residuals, sediments, and soils containing PCB concentrations 50 ppm or greater which are moved. However, as it applies to the KHL-OU 3 and the five former lagoons, some of the requirements of TSCA are waived as explained below..

Excavation of residuals and soils from the five former lagoons will be required. Some of these excavated residuals will contain PCBs at concentrations 50 ppm or greater. Excavation and consolidation of these residuals on-site could be considered disposal of PCBs pursuant to 40 CFR 761.1 (c). In this case, 40 CFR 761.60 (a) (4) would require any non-liquid PCBs at concentrations of 50 ppm or greater in the form of contaminated soils to be disposed of: (i) in an incinerator which complies with 761.70; or (ii) in a chemical waste landfill which complies with 761.75. The selected remedy provides for disposal of PCBs in a landfill that does not meet the following chemical waste landfill requirements of Section 761.75 (b): bottom liner requirements because the landfill does not have a bottom liner (761.75 (b) (1) or (2)); leachate collection requirements and requirements for a fifty-foot distance between the bottom liner and the historical high water table (761.75 (b) (3) and (b) (7). However, pursuant to 761.75 (c) (4), the EPA Regional Administrator has determined that for the KHL-OU 3, the TSCA chemical landfill requirements in 761.75 (b) (1), (2), (3), and (7), are not necessary to protect human health and the environment. For the KHL-OU 3, the low permeability site cover, long-term monitoring, access restrictions, and institutional controls included in the selected remedy provide protection to public health and the environment. The written

statement of this finding and waiver by the EPA Regional Administrator, as required in 761.75 (c) (4), is provided by signing this ROD.

The excavated material will be consolidated and stored in Cell 4 which is to be its final disposal location. The remedy will comply with 40 CFR 761.75 (b) (4) (i) and (ii), which requires diversion of surface water runoff from a 24-hour, 25-year storm. The remedy will also comply with 761.75 (b) (5) which requires surface water and groundwater monitoring, and 761.75 (b) (9) which includes requirements for support facilities. 40 CFR 761.75 (b) (8) is not an ARAR because it applies to the operations of chemical waste landfills.

Clean Water Act (CWA) - Ambient Water Quality Criteria:
This act and criteria establish monitoring requirements for the discharge of waste treatment effluents to waters of the United States. They are applicable to the excavation and dewatering of sediments from the Kalamazoo River and residuals from the five former lagoons. They would also be applicable for the dewatering of the pond and residuals in Cell 4.

Federal Water Pollution Control Act (WPCA), Toxic Pollution Standards:
This act would be applicable to the discharge to the Kalamazoo River of water from all dewatering activities.

State Chemical-Specific ARARs:

Part 201, Environmental Remediation, of the NREPA provides for the identification, risk assessment, and evaluation of contaminated sites within the state; therefore, Part 201, Environmental Remediation, of the NREPA is applicable or relevant and appropriate to soils, sediments and residuals at the KHL-OU 3. The EPA considers the substantive portions of Part 201, Environmental Remediation, of the NREPA, especially Section 20118, to be ARARs for the RA at this site. The rules provide, *inter alia*, that RAs shall be protective of human health, safety, welfare, and the environment of the state. To achieve the standard of protectiveness, Part 201, Environmental Remediation, of the NREPA, in particular those in Section 20120(a) and 20120(b), specify that a RA shall achieve a degree of cleanup under residential, industrial, or commercial criteria.

The MDEQ has determined that the limited industrial criteria pursuant to Sections 20120(a) and 20120(b) of the NREPA would be appropriate for the KHL and the five former lagoons. The property is zoned for industrial use, therefore, limited industrial criteria would provide an appropriate RA for the KHL and the five former lagoons. The limited industrial cleanup criteria of 21 ppm will be met. The unrestricted residential cleanup criteria of 1.0 ppm will be met on the landfill berms and in the KSSS floodplain.

Part 31, Water Resources Protection, of the NREPA establishes effluent standards in accordance with the Federal WPCA and the CWA, and also establishes rules specifying standards for several water quality parameters including PCBs. This would be applicable to the discharge to the Kalamazoo River of water from all dewatering activities.

b. Location-Specific ARARs:

Location-specific ARARs are those requirements that relate to the geographical position of a site. These include:

Federal Location-Specific ARARs:

TSCA:

TSCA establishes the requirements for disposal of sediments, soils, and residuals with PCB concentrations 50 ppm or greater. This would be an ARAR for containment or disposal of any residuals, sediments, and soils containing PCB concentrations 50 ppm or greater disposed of after February 17, 1978. It is believed that the PCB-contaminated residuals at the KHL-OU 3 and five former lagoons were disposed of prior to this date. However, TSCA would regulate the disposal of these excavated residuals. For this remediation some of the requirements of TSCA have been waived as explained above.

State Location-Specific ARARs:

Part 115, Solid Waste Management, of the NREPA:

Part 115, Solid Waste Management, of the NREPA contains regulations regarding the construction, operation, and closure of sanitary landfills, solid waste transfer facilities, and solid waste processing plants. These regulations govern the long-term monitoring and closure of the landfill. Part of the landfill area is licensed under this act.

c. Action-Specific ARARs:

Action-Specific ARARs are requirements that define acceptable treatment and disposal procedures for hazardous substances.

Federal Action-Specific ARARs:

CWA and Discharge to Waters of the United States:

The CWA and Discharge to Waters of the United States establishes site-specific pollutant limitations and performance standards which are designed to protect surface water quality. Types of discharges regulated under the CWA include discharge to surface water, indirect discharge to a Publicly Owned Treatment Works (POTW), and discharge of dredge or fill materials to United States waters. This Act is relevant to the treatment and discharge of water to the Kalamazoo River or POTW from the dewatering operations.

Rivers & Harbor Act:
The Rivers & Harbor Act prohibits unauthorized obstruction or alteration of any navigable water in the United States (dredging, fill, cofferdams, etc.). It also requires federal agencies, where possible, to avoid or minimize adverse impacts of federal actions upon wetlands and floodplains. Remedial activities conducted in such a way will avoid obstruction or alteration of the Kalamazoo River channel.

U.S. Department of Transportation (USDOT) Placarding and Handling:
USDOT Placarding and Handling regulates the transportation and handling of materials containing PCBs at concentrations of 20 ppm or greater. This ARAR may apply to transport of residuals from the five former lagoons, the KSSS, and the river adjacent to the landfill to Cell 4.

Clean Air Act:
The Clean Air Act establishes requirements for constituent emission rates in accordance with national ambient air quality standards. Excavation and cap construction activities will be regulated by the Clean Air Act.

State Action-Specific ARARs:

Part 91, Soil Erosion and Sedimentation Control, of the NREPA:
This Act regulates earth changes, including cut and fill activities which may contribute to soil erosion and sedimentation of surface water. Part 91, Soil Erosion and Sedimentation Control, of the NREPA would apply to any such activity where more than one acre of land is affected or the regulated action occurs within 500 feet of a lake or stream. Part 91, Soil Erosion and Sedimentation Control, of the NREPA would be applicable to the cap construction activities since these actions could impact the Kalamazoo River, which is less than 500 feet from the KHL-OU 3 and the five former lagoons.

Part 301, Inland Lakes and Streams, of the NREPA:
The Michigan Inland Lakes & Streams Act regulates the dredging or filling of lake or stream bottoms. Activities associated with the selected remedy, sediment removal, and berm stabilization are regulated under this Act due to the proximity of the KHL-OU 3 and the five former lagoons to the Kalamazoo River.

Part 115, Solid Waste Management, of the NREPA:
Part 115, Solid Waste Management, of the NREPA contains regulations regarding the construction, operation, and closure of sanitary landfills, solid waster transfer facilities, and solid waste processing plants. These regulations govern the long-term monitoring and closure of the landfill. The landfill area is licensed under this Act.

Part 41, Sewerage Systems, of the NREPA:
Part 41, Sewerage Systems, of the NREPA establishes rules regarding construction, operation, and maintenance of sewage systems. This may be applicable since the treated dewatering water is discharged to the municipal sewer system.

Part 31, Water Resources Protection, of the NREPA:
Part 31, Water Resources Protection, of the NREPA establishes the rules regarding water and wastewater discharges, provisions for the non-degradation of groundwater quality, and uses of groundwater. This is applicable for discharge of waters to the Kalamazoo River. Part 31, Water Resources Protection, of the NREPA also includes the rules regarding permit requirements for discharges. Although permits are not required for on-site Superfund actions, the substantive requirements must be met for all dewatering operations that discharge to the Kalamazoo River.

Part 55, Air Pollution Control, of the NREPA:
Rules prohibiting the emission of air contaminants in quantities which have injurious effects on human health, animal life , plant life of significant economic value, and/or property are established in Part 55, Air Pollution Control, of the NREPA. This would be applicable to excavation and cap construction activities.

Michigan Occupational Safety and Health (MIOSHA) Act 154:
MIOSHA establishes the rules for safety standards in the work place and is applicable to the remediation activities.

TSCA, 40 CFR 761, sets specific requirements for the disposal of PCBs and would therefore be applicable to the site.

Part 201, Environmental Remediation, of the NREPA:
As described earlier, the NREPA provides for the identification, risk assessment, and evaluation of contaminated sites within the state. The MDEQ has determined that the substantive provisions of Part 201, Environmental Remediation, of the NREPA are applicable or relevant and appropriate to the KHL-OU 3 and the five former lagoons. Part 201, Environmental Remediation, of the NREPA rules require that RAs shall be protective of human health, safety, welfare, and the environment of the state.

3. Cost-Effectiveness

Table 1 lists the costs associated with implementation of the selected remedy.

Table 1
Total estimated cost for the selected remedy at the KHL-OU 3:

Alternative	Total Capital Cost	Total O&M. per Yr.	Total Present Worth
1	$1.6 - $2.7 million	$125,000	$3.2 - $4.3 million

The selected remedy for the KHL-OU 3 And the five former lagoons are cost-effective because it provides the greatest overall effectiveness proportionate to its cost when compared to the other alternatives evaluated, the net present worth being $3.2 - $4.3 million. The estimated cost of the selected remedy is much lower than the cost of Alternatives 2 and 3, and assures a high degree of certainty that the remedy will be effective in the long-term due to the significant reduction of the mobility of the PCBs achieved through containment of the source material and the prevention of leachate generation.

4. Utilization of Permanent Solutions and Alternative Treatment Technologies to the Maximum Extent Practicable

The selected remedy represents the maximum extent to which permanent solutions and treatment technologies can be used in a cost-effective manner at the KHL-OU 3. Of those alternatives that are protective of human health and the environment and that comply with ARARs, the state of Michigan and the EPA have determined that the selected remedy provides the best balance in terms of long-term effectiveness and permanence, reduction of toxicity, mobility, or volume of contaminants, short-term effectiveness, implementability, and cost, taking into consideration state and community acceptance.

Consolidation of residuals outside the landfill into Cell 4 in addition to the installation and maintenance of a final cover for the landfill, groundwater monitoring, and restriction of access through installation of a fence and institutional controls, will provide the most permanent solution practicable, proportionate to cost.

5. Preference for Treatment as a Principal Element

Based on current information, the EPA and the State of Michigan believe that the selected remedy is protective of human health and the environment and utilizes permanent

solutions and alternative treatment technologies to the maximum extent possible. The remedy, however, does not satisfy the statutory preference for treatment of the hazardous substances present at the KHL-OU 3 as a principal element because such treatment was not found to be practical or cost-effective at the KHL-OU 3.

K. SUMMARY

The selected remedy will satisfy the statutory requirements established in Section 121 of CERCLA, as amended by SARA, to protect human health and the environment, will comply with ARARs or provide grounds for invoking a waiver, and will use permanent solutions and alternate treatment technologies to the maximum extent practicable.

Treatment is not a component of the selected remedy because an attempt to treat the PCBs present at the KHL-OU 3 and the five former lagoons would not provide a sufficient significant additional decrease in risk presented by the KHL-OU 3 and the five former lagoons to justify the increased cost of attempting to incinerate the PCBs.

L. RESPONSIVENESS SUMMARY

The public participation requirements of CERCLA sections 113 (k) (2) (i-v) and 117 of CERCLA have been met during the remedy selection process. Section 113 (k) (2) (i-v) and 117 of CERCLA require the state as the lead agency to respond "... to each of the significant comments, criticisms, and new data submitted in written or oral presentations" on a Proposed Plan for an RA. The Responsiveness Summary addresses the concerns expressed by the public, PRPs, and governmental bodies in written and oral comments received by the MDEQ regarding the Preferred alternative for the KHL-OU 3.

OVERVIEW

At the time of the public comment period, the MDEQ as lead agency, in consultation with the EPA, the support agency, had proposed a preferred alternative for the KHL-OU 3 in the city of Kalamazoo, Michigan. The preferred alternative addressed the PCB-contaminated soils, sediments and residuals associated with the KHL. The preferred alternative specified in the ROD includes capping and containment of the KHL. Prior to construction of the cap, the excavation and on-site containment of PCB-contaminated soils, sediments and residuals from the landfill berms, Georgia-Pacific Corporation's five former lagoons, the adjacent river, and the KSSS floodplain, into Cell 4 of the KHL, will be conducted.

Judging from the comments received during the public comment period, the selected alternative was generally supported. The residents would prefer not to have a nonproductive zone (i.e., the closed landfill) in their community and their comments dealt with issues of the long-term effectiveness of the selected alternative. The PRPs would only support the selected alternative.

These sections follow:
Background on Community Involvement and Concerns
Summary of Comments Received During the Public Comment Period and the MDEQ's Responses
Attachment: Community Relations Activities at the KHL OU 3

BACKGROUND ON COMMUNITY INVOLVEMENT AND CONCERNS

Prior to the KHL being included in the site as a source area, community involvement was non-existent. Since the KHL became part of the site, the MDEQ has issued seven progress reports and hosted eleven public meetings during the scoping of the RI for the KHL-OU 3, the five former lagoons, and the site. During the public meetings the MDEQ provided background information on the KHL-OU 3 and the five former lagoons, explained the Superfund process, and provided details of the upcoming investigation. During July 1993, the MDEQ issued a fact sheet describing the RI work being conducted at the KHL-OU 3. All phases of the RI were completed by December 1996. The MDEQ issued other fact sheets and progress reports summarizing the results of the investigation. The MDEQ distributed a third fact sheet in June 1996 that described the dike stabilization project conducted as an interim action.

The EPA awarded a Technical Assistance Grant (TAG) for this site to the Kalamazoo River Protection Association (KRPA). The KRPA is a member of the Citizens Advisory Committee (CAC) established by the MDEQ. The MDEQ also established the Government Advisory Committee (GAC) comprised of all interested elected officials from local, state and federal governments. A list of meeting dates, attendees, and topics discussed at each meeting concerning the KHL-OU 3 can be found in Attachment 1 of this ROD.

Results of the RI were presented to the GAC/CAC on March 9, 1994. Results of the Risk Assessment and Focused Feasibility Study (FFS) were presented to the GAC/CAC on August 24, 1994. The results of the Cell 4 investigation performed in January 1995 were presented at GAC/CAC meetings in March 1995. Technical Memorandum 15, Mill Investigations, contains the results of the RI for the five former lagoons. This document was placed in the six information repositories listed in Table 2 in August 1996.

Fieldwork for the KHL-OU 3 RI got underway in July 1993. The MDEQ held nine meetings and issued eight progress reports/fact sheets detailing the RI work and the RI findings at the KHL-OU 3. The RI and FS reports were released to the public and placed in the six information repositories, listed in Table 2 , in July 1994 and in September 1994, respectively. The Proposed Plan was also released for public review in September 1994. The Administrative Record has been made available to the public at the Superfund Section of the MDEQ in Lansing, Michigan, and at the six information repositories established at the locations shown in Table 2.

In August 1994 the MDEQ approved the FFS report. The Proposed Plan for the KHL-OU 3 was released to the public for review in September 1994. These documents were made available to the public at the office of the Superfund Section, MDEQ, in Lansing, Michigan, and the information repositories.

TABLE 2

Allegan Public Library 180 South Sherwood Allegan, Michigan (616) 673-4625	Charles Ransom Library 331 Hubbard Street Plainwell, Michigan (616) 685-8024	Comstock Township Library* 6130 King Highway Comstock, Michigan (616) 345-0136
Kalamazoo Public Library 316 South Rose Kalamazoo, Michigan (616) 342-9837	Otsego District Library 219 South Farmer Otsego, Michigan (616) 694-9690	Waldo Library Western Michigan University Kalamazoo, Michigan (616) 387-5156

A public meeting was held on September 14, 1994 to discuss the FFS and the Proposed Plan. The meeting was attended by approximately 25 persons, including local residents and representatives of the PRPs. At the meeting, representatives from the MDEQ and the PRPs answered questions about the KHL-OU 3 and the remedial alternatives under consideration. Formal oral comments on the Proposed Plan were documented by a court reporter. A verbatim transcript of questions and answers and public comments during the public meeting has been placed in the information repositories and Administrative Record. Written comments were accepted at the meeting and by mail and were also included for placement in the information repositories.

The Proposed Plan was available for public comment from September 14, 1994 through November 14, 1994. Comments received during this public comment period were reviewed, and the MDEQ's responses are included in this Responsiveness Summary. Advertisements announcing the availability of the Proposed Plan and start of the public comment period were published in the *Kalamazoo Gazette, the Union Enterprise, Allegan County News & Gazette, Holland Sentinel, and the Kalamazoo Gazette-North.*

Responding to public comments and a request by the MDEQ for additional groundwater and Cell 4 data, the PRP's conducted additional limited RI sampling. In the meantime, the Mill investigation was completed and the five former lagoons were identified as an area in need of remediation. Because of the modifications made to the original preferred alternative, the MDEQ issued a Revised Proposed Plan on July 1, 1997. The public comment period was from July 1, 1997 through July 30, 1997. A Revised Proposed Plan meeting was held on July 16, 1997. Comments received during this public comment period were reviewed, and the MDEQ's responses are included in this Responsiveness Summary. Advertisements announcing the availability of the Proposed Plan, the Proposed Plan meeting, and start of the public comment period were published in the

* No longer an information repository for the site. It has been replaced by the Saugatuck-Douglas District Library, Center Street, Douglas, MI 49406, 616-857-8241.

Kalamazoo Gazette, the Union Enterprise, Allegan County News & Gazette, Holland Sentinel, the Kalamazoo Gazette-North, and City Life (published by the Kalamazoo Gazette).

SUMMARY OF SIGNIFICANT COMMENTS

Many of the comments below have been paraphrased to effectively summarize them in this document. The reader is referred to the Administrative Record, located at the Information Repositories, which contains copies of all oral and written comments submitted to the MDEQ.

Comment 1

Several commenters and the KRPA expressed concerns regarding the amount of time for review of the RI/FFS documents. Specific comments include: there should have been more time prior to the September 14 public meeting to review the documents; the time for providing comments on the Proposed Plan should be extended; and there should be another meeting to answer questions.

Response 1

In response to the expressed concerns regarding the amount of time to review the RI/FFS documents and develop comments, and a specific request made during the public meeting on September 14, 1994, the public comment period was extended an additional 30 days to November 14, 1994.

Both the state and federal regulations require that the public be given opportunities to review and comment on proposed RAs. As stated in Part 201, Environmental Remediation, of the NREPA, Section 324.20120d, the public is encouraged to comment prior to MDEQ approval of a proposed plan for RA. In the CERCLA regulations [40 CFR 300.430(f)(3)(I)(C)], a minimum of 30 days is provided to review the Proposed Plan and supporting information.

Based on the MDEQ's experience in landfill remediations under the NREPA , the agency believes that a 60-day comment period in this case is sufficient to obtain complete public comments on the Proposed Plan. The MDEQ will continue to meet with the public regarding the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund site.

Comment 2

Two commenters provided comments related to the future recreational use of the river in the area of the KHL. The expressed concerns were that Alternative 1 needs to be compatible with future recreational use, which may include the proposed river trail system and boating activities along the river. Specific comments included that Alternative 1 should not pose a physical danger to boaters and that related liabilities be

addressed, and that the remediated KHL-OU 3 should not pose a danger to future users of a river trail system.

Response 2

The post-closure plan for the KHL-OU 3 will necessarily include institutional controls such as access restrictions as required by Part 115, Solid Waste Management, and Part 201, Environmental Remediation, of the NREPA. Nevertheless, the implementation of Alternative 1 is not expected to prohibit the development of a trail in the area.

Alternative 1 is protective of human health and the environment. Protectiveness is provided by the NREPA cap, dike stabilization, consolidation of residuals, erosion control, long-term monitoring, and institutional controls. The landfill cap and institutional controls protect the public from exposure to PCBs contained in the landfill.

The steel sheet-pile wall was installed to stabilize the landfill dike. The design of this wall does not present a hazard to navigation.

The nature of liabilities for the owner of the landfill and users of the adjacent river is essentially the same as those that exist today or those that are associated with other private lands along the river.

Comment 3

Two commenters and the KRPA provided comments regarding the compliance of Alternative 1 with ARARs, questioning whether Alternative 1 complies with Acts 307 or 641. In addition, the commenter stated that "the interpretation of 40 CFR 761 is not satisfactory." The commenter claimed that the "standards" of Act 307 would not be met by Alternative 1 and that the alternative would "not meet the full construction requirements for full compliance with Act 641."

Response 3

During the FFS evaluation process, all three alternatives were assessed as to their compliance with federal and state ARARs. As noted in the text of the ROD, Part 115, Solid Waste Management of the NREPA (formerly Act 641) provides siting, construction, cap, monitoring and other requirements for certain Michigan landfills.

Because Cells 1 through 3 of the KHL were licensed prior to implementation of Part 115, the regulation's siting and construction requirements do not apply to these cells. Furthermore, MDEQ does not believe the siting and construction requirements are relevant and appropriate to the selected alternative. With regard to Cell 4, MDEQ does not generally require unlicensed landfills that are in the process of closing to comply with the siting and construction requirements of Part 115. MDEQ believes that such

requirements are neither applicable nor relevant and appropriate to the remedy selected for Cell 4 in this ROD.

It is important to note that the remedy selected in this ROD will comply with all of the closure requirements in Part 115. In other words, MDEQ determined that the capping and closure requirements of Part 115 were either applicable or relevant and appropriate to this selected remedy.

Part 201, Environmental Remediation, of the NREPA (which supersedes Act 307) requires the cleanup of sites to levels which, based upon considerations of future land use, do not present a risk to human health or the environment. Limited Industrial criteria apply because the KHL area is, and will continue to be, restricted to industrial land uses under local zoning ordinances. Based upon analyses contained in the site-specific RA for the KHL-OU 3 and the FFS, Alternative 1 will put controls in place so the KHL-OU 3 will not present a risk to human health or the environment. Therefore, Alternative 1 meets Limited Industrial criteria and complies with Part 201, Environmental Remediation, of the NREPA.

The following provides additional information regarding the interpretation of 40 CFR 761 with respect to Alternative 1 as presented in the FFS. The regulations developed under the TSCA, which govern the disposal of PCB, are presented in 40 CFR 761. Subpart D - Storage and Disposal of 40 CFR 761 begins with this note:

> "This subpart does not require removal of PCB and PCB Items from service and disposal earlier than would normally be the case. However, when PCB and PCB Items are removed from service and disposed of, disposal must be undertaken in accordance with these regulations. PCB (including soil and debris) and PCB Items which have been placed in a disposal site are considered to be 'in service' for purposes of the applicability of this subpart. This subpart does not require PCB and PCB Items landfilled prior to February 17, 1978 to be removed for disposal. . . ."

The description of the history of disposal of residuals that contained PCB concentrations 50 ppm or greater as presented in the FFS, together with the wide experience base in applying this "pre-1978" exemption to landfill sites, support the interpretation that 40 CFR 761 is not an ARAR. This would apply to the PCB-contaminated materials that are capped and contained in-place.

Although the EPA agreed that TSCA was not an ARAR for the proposed plan, the subsequent decision to consolidate residuals from the five former lagoons near the landfill into Cell 4 resulted in TSCA becoming an ARAR. The TSCA disposal regulations at 40 CFR Section 761.60 et seq. are applicable to PCBs at concentrations of 50 ppm or greater when such PCBs are "taken out of service". Under the RAs being considered, TSCA disposal regulations could be triggered by excavation of PCB-contaminated soils, and residuals from the five former lagoons. These materials will be consolidated into Cell 4. Pursuant to 40 CFR Section 761.60 (a) (4), PCBs must be disposed of: "(i) in an

incinerator which complies with 761.70; or (ii) in a chemical waste landfill which complies with 761.75." The TSCA compliant chemical waste landfill disposal method is generally much less expensive than incineration.

The on-site consolidation and containment of PCBs, whether from sediments, soils, or residuals excavated from the five former lagoons will be placed in Cell 4. Cell 4, being an existing landfill cell does not possess the following chemical waste landfill requirements found in Section 761.75 (b):

- Bottom liner requirements (the landfill does not have a bottom liner) (761.75 (b) (1) and (2))
- Fifty foot distance between bottom liner and historical high water table (761.75 (b)(3))
- Leachate collection requirements (761.75 (b)(7))

Pursuant to 761.75 (c) (4), the EPA Regional Administrator has determined that one or more of the requirements in 761.75 (b) is not necessary to protect against unreasonable risk of injury to health or the environment from PCBs and may waive such requirements. In this ROD , the EPA Regional Administrator waives the requirements in 761.75 (b) (1), (2), (3) and (7) for the following reasons:

1. The final RA will provide protection to human health and the environment against unreasonable risks of injury.
2. No significant reduction in the long-term risks would be gained from off-site disposal of the small quantity of PCBs in excavated residuals, sediments, and soils because the bulk of the PCBs will be contained in place under the final cover.

Comment 4

A number of commenters and the KRPA expressed preferences for treatment of the PCB-containing residuals. For several commenters, this was at least part of their basis for stating opposition to Alternative 1 and support for alternatives that include removal. For other commenters, this preference was communicated as part of their support of Alternative 1 in a recommendation that provisions be made to allow for future treatment of the residuals at such time as "technology becomes available to treat the affected residuals," "in a reasonable and safe manner." One commenter recommended the siting of an incinerator central to all of the OUs to treat not only KHL-OU 3 residuals, but those from other OUs as well. A related comment offered by one commenter is that Alternative 1 does not address complete reduction of mobility and toxicity.

Response 4

The essential requirement of remediation is that it be protective of human health and the environment. Alternative 1 satisfies that requirement and has greater short-term

effectiveness than Alternative 3, which includes treatment. The greater short-term effectiveness is due to the shorter schedule for completion of Alternative 1 as compared to Alternative 3 and the fewer short-term negative human health and environmental risks associated with excavation, transport, and treatment. In addition, Alternative 1 is more implementable and less costly than Alternative 3.

The siting of a central incineration facility might in theory reduce the unit costs of incinerating KHL-OU residuals. The reduction in costs relative to on-site incineration, if any, (costs for transportation of residuals both to and from the facility would need to be evaluated) would not sufficiently compensate for the predictable decrease in implementability that would accompany configuration of such an alternative. It is doubtful that such an alternative would be preferable to on-site incineration.

The potential for future treatment after implementation of Alternative 1 exists in the five-year review provision of CERCLA Section 121(c). The EPA will conduct a review of site conditions every five years. If, after reviewing site conditions, a significant risk were found as a result of failure of the remedy to be protective, the remedy will be reconsidered. At such time, the availability of cost-effective treatment technology could be further evaluated. It is important to note that treatment will not need to be considered if the remedy is working as designed.

The implementation of Alternative 1 will provide a reduction in the potential mobility of the residuals by cap placement, dike stability, and erosion control. Cap placement will minimize the potential for PCB migration via dust generation, surface water runoff, and groundwater flow. Dike stabilization and erosion control measures will minimize the potential for dike erosion or failure, thereby reducing the potential migration of PCB-containing residuals to both the site and the Kalamazoo River.

Comment 5

Two commenters and the KRPA stated that Cell 4 should be included in the remediation.

Response 5

Cell 4 will be included in the remediation as described earlier. The FFS stated that additional information was needed to determine the appropriate action for Cell 4. After a comprehensive probing and sampling investigation of Cell 4 in January 1995, remedial alternatives specific to Cell 4 were evaluated. The MDEQ concluded that of the four alternatives (i.e., no action; containment under a cap similar to that selected for Cells 1, 2, and 3; on-site disposal in Cells 1, 2, and 3; or off-site treatment and disposal), containment under Part 115, Solid Waste Management, of the NREPA Type III cap (which includes an impermeable liner) best achieves all criteria required by state and federal guidelines. An important consideration in the selection process was additional data that indicate Cell 4 residuals are similar in many respects to residuals contained in

Cells 1, 2, and 3. These residuals reside at the same elevation, have similar PCB concentrations, are composed of the same materials, have the same physical properties and originated from the same production process.

Comment 6

A number of commenters and the KRPA expressed concerns regarding the long-term effectiveness of Alternative 1. One commenter stated that there must be responses to any future release of PCB from the KHL-OU 3 if detected by long-term monitoring. Another commenter believed the issue of infiltration of groundwater beneath the KHL-OU 3 would not be adequately addressed by Alternative 1. One commenter stated that construction materials that would last more than 30 years should be selected, while another commented that the selected materials should last 500 years. One commenter suggested the construction of a "steel sea wall" to provide long-term protection of the dike. One commenter questioned if a steel retaining wall had a long enough life expectancy. Another questioned why only 30 years was used to address monitoring, and expressed the need for financial assurances for future work at the KHL-OU.

Other comments related to the long-term effectiveness of Alternative 1 included questions and statements regarding the potential future impacts of river meander and rare flood events.

Response 6

It was concluded in the FFS that Alternative 1 will be effective over the long-term. According to the requirements of the NCP, the three alternatives were evaluated using two threshold criteria and five primary criteria. Long-term effectiveness and permanence was one of the five primary criteria, and it was concluded that Alternative 1 will provide for long-term effectiveness and permanence. Long-term monitoring and maintenance of the KHL-OU 3, including the structures used to isolate residuals and PCB from human contact and the river, are necessary components of Alternative 1 to assure long-term effectiveness. As part of the post-closure plan for the permitted landfill, a monitoring program will be established and approved by the MDEQ.

Monitoring and maintenance activities will proceed for an indefinite period of time to assure long-term effectiveness. The 30-year duration of monitoring and maintenance activities employed in the FFS for cost-estimating purposes was selected to be consistent with EPA guidance. EPA guidance for FS states that "In general, the period of performance for costing purposes should not exceed 30 years for the purposes of the detailed analysis."

With respect to financial assurances, as required under the current Parts 201 and 115 of the NREPA Landfill operating permit for the KHL, a Perpetual Care Fund will be established and maintained to be used exclusively for closure, monitoring, and

maintenance of the landfill and for response activities necessitated by a discharge from the facility.

Ongoing monitoring in conjunction with the five-year review provision of CERCLA will provide the necessary technical, legal, and administrative tools necessary to detect and respond to conditions to assure the long-term protectiveness of human health and the environment from PCBs at the KHL-OU.

The design of Alternative 1 will consider the future forces of the river and how changes in upstream conditions could affect the long-term effectiveness of the alternative. Specifically, the dike stabilization measures will be designed to withstand the erosive forces of extreme high-flow events. In addition, changes in upstream land use and structures that could affect the stability of the containment system at the KHL will be monitored. The incorporation of such monitoring in Alternative 1 was in response to a similar comment from the public made on August 24, 1994.

In December 1996 the construction of a steel sheet-pile wall along 900 feet of the dike that separates Cells 1, 2, and 3 from the Kalamazoo River was completed. The work extends the existing 120 feet of retaining wall installed in 1994 after a storm uprooted trees on the dike. The FFS reviewed two options for stabilizing the dike: placing rock-filled wire baskets called gabions, or installing steel sheet pilings. Although gabions were originally proposed, the steel sheet piling has now been selected and installed because of its site-specific advantages over gabions. For example, based upon the small repair project in 1994, there is a greater degree of confidence that the sheet piling could be properly constructed and result in fewer construction impacts on the river than gabions. By extending the retaining wall two feet above the 100-year flood elevation, the sheet pile will prevent surface water runoff from eroding soils into the river and will protect the dike and KHL-OU from severe flood events.

Comment 7

Three commenters stated their support of Alternative 1. One of the commenters provided unqualified support noting that it: "is the lowest cost while protecting the environment;" "doesn't increase short term risk of PCB escaping by disturbing the site;" and "can be completed more quickly than Alternatives 2 and 3." A second commenter, in agreeing that Alternative 1 "is the most desirable at this time," also expressed a preference to see the "site cleaned up" but that he "understand[s] the ramifications of disturbance and incineration, and cannot really see just moving the contaminants to another site." The third commenter noted support of "this remedy as an interim solution."

Response 7

The MDEQ acknowledges these comments.

Comment 8

One commenter asked a question about how the remediation contract would be awarded and expressed concerns regarding the quality of remediation if the contract simply went to the lowest bidder.

Response 8

Although it remains to be determined exactly how contracting would proceed, performance-based contract specifications and a construction quality assurance program are prominent and necessary features of remedial contracting. Contractor qualifications and experience, the reliability of the contractor's proposed approach to meet the performance specifications, and costs are all important considerations in contractor selection. Note also that the AOC requires the MDEQ's review of contractor qualifications and the MDEQ's oversight of all aspects of the remediation to ensure the remedy is constructed as designed.

Comment 9

One commenter and the KRPA requested another round of groundwater sampling because the quantitation limit for the analyses of the RI samples (1 µg/L) was higher than the recommended PCB detection limit presented in MDEQ guidance.

Response 9

In response to this comment, an additional round of groundwater sampling was performed in August 1995. PCBs were not detected in any of the groundwater samples at a detection limit of 0.2 µg/L. Also, it should be noted that the compliance groundwater monitoring program required by the landfill's operating permit has collected several years of data at or below the MDEQ Target Detection Limit of 0.2 µg/L. PCBs were not detected in any of these samples.

Comment 10

One commenter claimed that the incineration costs presented in Alternative 3 were substantially overestimated since fuel costs would be lower because of greater British Thermal Unit (BTU) value of residuals. It was claimed that as a result, incineration costs should be only half of those presented in the FFS.

Response 10

As part of the alternatives evaluated in the FFS, Alternative 3 indicated costs associated with on-site and off-site incineration. Vendors offering on-site incineration and off-site incineration services that were contacted during the FFS for cost information noted that costs for incineration would not likely change based upon any further consideration of the BTU value of the residuals. Based upon the analysis of the costs of hazardous waste incineration projects, the reason that total costs are insensitive to the BTU value is that fuel costs are not a relatively large cost component of hazardous waste incineration projects.

Comment 11

Two commenters expressed concern regarding the precedent set by Alternative 1 for the KHL-OU 3 with respect to containment remedies at other portions of the site.

Response 11

The individual OUs and the site will be investigated and evaluated separately, consistent with the Consent Order between the MDEQ and the PRPs, and consistent with CERCLA and Part 201, Environmental Remediation, of the NREPA.

Comment 12

A number of commenters and the KRPA expressed concern about the use of the Part 201, Environmental Remediation unrestricted residential cleanup criteria for PCBs of 2.3 ppm being used for the KSSS floodplain soils. Their concern was twofold. The first concern was that the unrestricted residential cleanup criteria for PCBs of 2.3 ppm is based on human health and not on ecological receptors such as mink. The second was that this may set precedent for the cleanup of the Kalamazoo River, Portage Creek and their wetlands/ floodplains. The commenters recommended that the cleanup criteria be set at 0.33 ppm for sediments to protect the environment. The comments pointed out that this is the cleanup number that the Surface Water Quality Division (SWQD) of the MDEQ has recommended at other sites for the cleanup of PCBs in sediments.

Commenters also indicated that using visual criteria for consolidating residuals back into the landfill from the Kalamazoo River was not appropriate because some of the sediments in the river that are contaminated do not have the gray clay appearance.

Response 12

The Part 201, Environmental Remediation, unrestricted residential cleanup criteria for PCBs is now 1.0 ppm and not the previously level of 2.3 ppm that was listed in the

Re: ; Proposed Plan. The change in this criteria is due to the change in the percent abs ion factor from 1 percent to 14 percent. This factor is used by both the MDEQ and EPA. The MDEQ recognizes that the Part 201, Environmental Remediation, unr: cted residential cleanup criteria for PCBs of 1.0 ppm is based on risk assessment for protection of human health. However, the MDEQ believes that this limited action on s using the soil criteria is appropriate and will be protective of human health and the : ronment. The focus of the remedial action to consolidate the residuals back into the L from the KSSS floodplain and the Kalamazoo River immediately adjacent to the KH: very limited and addresses a very small amount of residuals situated next to the KH: his action would consolidate these residuals back into the KHL from which they orig: d and prevent them from eroding into the Kalamazoo River where it has the pote: to cause a human health and environmental impact.

This anup action is focused on the KHL-OU 3 and not on remediating the Kalamazoo Rive it's floodplains. These areas will be addressed by other RODs. Because the focu: this ROD is the remediation of the KHL-OU 3 and the five former lagoons and not r: diating the river or floodplains, except in this limited area, it will not set prece: for the cleanup of these areas. If the ROD for the Kalamazoo River sets more restri: cleanup numbers, for the river sediments and floodplain soils, the river and flooc in area will be re-evaluated to determine if additional actions are necessary.

Comm: nters are correct in stating that sediments can be contaminated with PCBs and may r show any visual criteria. The MDEQ acknowledges this fact. Once again the purpc of this ROD is not to conduct a river cleanup but a consolidation of residuals back : the KHL for the purpose of remediating the KHL-OU 3. This action will remed: e only residuals that are in the river. Once the RI/FS for the river is completed and a : OD for the river sets the cleanup criteria for river sediments, the sediments along the K: -OU 3 will be re-evaluated to determine if additional actions are necessary.

Comment 13

The KRPA expressed concern that the five former lagoons would only be remediated down t: a PCB cleanup level of 21 ppm.

Respon: e 13

The Par: 201, Environmental Remediation limited industrial cleanup criteria for PCBs is 21 ppm. The land that contains the five former lagoons is zoned industrial and, therefore, it is appropriate to apply the limited industrial cleanup criteria.

Comment 14

Two commenters and the KRPA expressed a concern that the remediation of the KHL-OU 3 would destroy critical habitat for wildlife along the Kalamazoo River. The shoreline area of the river acts as a important corridor for wildlife. They requested that a

green zone be provided along the edge of the river to restore some of the habitat lost by the construction of the remedy. Another suggestion was to move the edge of the landfill back from the river to provide a important wildlife corridor.

Response 14

The MDEQ and the Michigan Department of Nature Resources are discussing with the PRPs the use of plants that would provide both habitat and a green zone at the KHL-OU 3 as part of the remedy. This issue will be investigated in the Remedial Design for the remedy.

Comment 15

One commenter and the KRPA asked for a 30-day extension of the public comment period for the Revised Proposed Plan.

Response 15

After careful review of the small amount of modification to the preferred alternative presented in the original Proposed Plan the MDEQ determined that the 30-day time extension for public comment was not warranted. The request was denied.

Comment 16

The KRPA opposes the TSCA waiver in favor of the total removal of the PCB-contaminated waste from the KHL-OU 3.

Response 16

The TSCA waiver applies to the removal of 3,000 cubic yards of PCB-contaminated residuals and soils from the five former lagoons and its disposal into Cell 4 of the KHL-OU 3. If the five former lagoons were not being remediated by this action the TSCA waiver would not be necessary. However, the addition of this material into the KHL-OU 3 prior to construction of the cap will not cause any problems. The materials being removed from the five former lagoons are identical to the materials already in the KHL-OU 3, with one exception, the concentrations of PCBs are lower. The review of the preferred alternative indicates that it is not necessary to require a bottom liner, a leachate collection system or the 50 foot separation distance between the waste and the top of the high groundwater table at the KHL-OU 3. These requirements all focus on resolving a groundwater contamination problem. The KHL-OU 3 does not have a groundwater contamination problem to resolve. No PCBs have ever been detected in the groundwater under the KHL-OU 3. By singing this ROD, the EPA Regional Administrator will have determined that these three requirements are not necessary to protect human health and the environment against unreasonable risk or injury.

Attachment 1
Community Relations Activities for the KHL-OU 3 of the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site

Community relations activities conducted at the KHL-OU 3 have included:

December 5. 1990 Pre-meeting With Local Officials

A meeting was held with local elected officials prior to the general public meeting on the scoping of the RI. The site history, Superfund process, RI, and the TAG were discussed.

December 12. 1990 Public Information Meeting

The start of the scoping process for the RI was announced. Held in the city of Kalamazoo, this meeting provided information about the site history, the Superfund process, the RI, and the TAG. It was also the first meeting since the site was placed on the NPL.

March 19. 1991 Public Information Meeting

Attendees included two neighborhood organizations from the city of Kalamazoo. Site history, RI scoping, the Superfund process, the AOC and risk assessments were discussed.

January 15. 1992 Public Information Meeting

Progress on the development of the RI/FS work plan and site status were presented at the meeting held in the city of Allegan. The KRPA discussed the TAG.

December 2. 1992 Meeting with the KRPA

TAG responsibilities and the KRPA's role in the Superfund process and the community were discussed at the meeting. Scoping for the RI was also discussed.

January 13. 1993 First GAC Meeting

Twenty participants from local governments were present at the meeting held in the city council chambers in the city of Plainwell. The January 1993 Site Problem Statement was distributed and discussed and Progress Report #5 concerning the RI was reviewed.

February 17. 1993 Public Information Meeting

A progress report on the work plan development for the RI was presented. The project managers explained the Superfund process and discussed the OU work plan. A brief overview of the Portage Creek/Kalamazoo River work plan was also presented.

February 23, 1993 GAC Meeting #2

The MDEQ and GAC members discussed OU work plans at the meeting held at the Parchment City Hall.

March 3, 1993 Public Information Meeting

A progress report on the RI was presented at the meeting which was held in the city of Allegan. Project managers presented an explanation of the Superfund process and discussed the Portage Creek/Kalamazoo River work plan development. A brief overview of the OU work plan was also presented.

March 18, 1993 First CAC Meeting

The project managers presented a description of the Superfund process, an overview of the work plan development, and other site information. The KRPA was introduced to the public. There was a presentation on the Area of Concern program, a program administered by the SWQD that addresses a variety of issues related to the river basin. The meeting was held at the Plainwell Comfort Inn in the city of Plainwell.

November 3, 1993 CAC Meeting #4

The MDEQ discussed the Superfund process and gave a progress report and update on the KHL-OU 3 and the site RI. The schedule for submittal of draft documents to the MDEQ was distributed and discussed. The meeting was held at the Plainwell Comfort Inn in Plainwell.

November 3, 1993 GAC Meeting #6

The MDEQ discussed the Superfund process and gave a progress report and update on the KHL-OU 3 and the site RI. The schedule for submittal of draft documents to the MDEQ was distributed and discussed. The meeting was held at the Plainwell Comfort Inn in Plainwell.

November 18, 1993 Presentation to the Kalamazoo Environmental Council

The MDEQ presented the Superfund process, updated site progress, and gave an overview RI/FS. Future expectations related to the RI were also discussed.

December 8, 1993 Public Information Meeting-Progress Update

The MDEQ provided an overview of the Superfund program and an update on the progress being made in the KHL-OU 3 and site RI. Additional comments were provided

by the KRPA. Approximately 40 people attended the meeting, which was held at the Comfort Inn in Plainwell.

March 5, 1994 GAC Meeting #8, CAC Meeting #6

The results from the RI of the KHL contained in Technical Memorandum #6, King Highway Landfill Operable Unit, were presented and a project update was provided. The meetings were held at the Comfort Inn in Plainwell.

August 24, 1994 Combined GAC & CAC Meeting

A presentation on the FFS for the KHL was given to the CAC and elected officials. Meetings were held at the Comfort Inn in Plainwell.

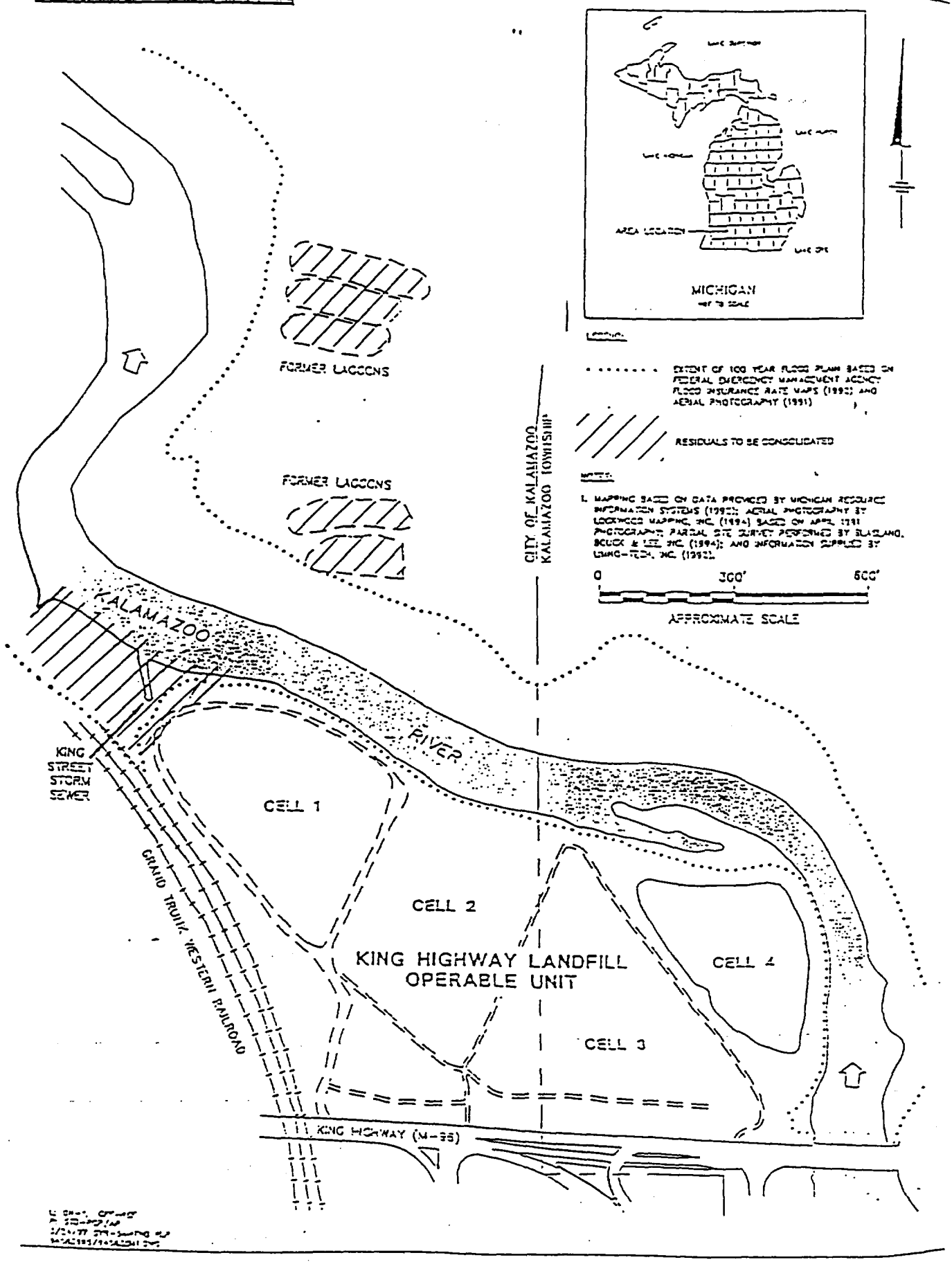
September 14, 1994 Proposed Plan Public Meeting

The King Highway Proposed Plan public meeting was held at the High School in Comstock.

March 8, 1995 Combined GAC and CAC Meeting

The KHL-OU 3 was discussed, as well as additional RI work and the ongoing PRP search.

Figure 1 - King Highway Landfill Operable Unit



KING HIGHWAY LANDFILL OPERABLE UNIT-3 OF THE
ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER
SUPERFUND SITE, KALAMAZOO COUNTY, MICHIGAN

ADMINISTRATIVE ORDER BY CONSENT
REMEDIAL DESIGN/REMEDIAL ACTION

STATEMENT OF WORK

I. PURPOSE

The purpose of this Statement of Work ("SOW") is to set forth requirements pursuant to State and Federal law for implementation of the Remedial Action ("RA") set forth in the Record of Decision ("ROD"). This ROD included the King Highway Landfill Operable Unit 3 ("KHL-OU3") and the Georgia Pacific former mill lagoons 1, 2, 3, 4, and 5, referred to in the ROD as "five former lagoons" (referred to herein as "Mill Lagoons") of the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site. The ROD was signed by the Director of the Michigan Department of Environmental Quality ("MDEQ") and the Regional Administrator of United States Environmental Protection Agency ("EPA") Region 5 on October 17, 1997 and February 10, 1998, respectively. Georgia-Pacific Corporation ("Georgia-Pacific") shall follow the ROD, the SOW, the approved Remedial Design ("RD"), and any guidance provided by the MDEQ in submitting deliverables for designing and implementing the RA at the KHL-OU3 and the five former lagoons.

II. PERFORMANCE STANDARDS FOR DESIGN AND CONSTRUCTION OF THE RA

Georgia-Pacific shall design and implement the RA to meet the performance standards and specifications set forth in the KHL-OU3 ROD and this SOW. Performance standards shall include cleanup standards, standards of control, and quality criteria, as well as other substantive requirements, criteria, or limitations including all Applicable or Relevant and Appropriate Requirements ("ARARs") set forth in the ROD, SOW, and Administrative Order by Consent ("AOC").

The purpose of the RA is to eliminate or reduce the potential migration of polychlorinated biphenyls ("PCBs") to the Kalamazoo River from the KHL-OU3 and the five former lagoons. The RA, when implemented, will reduce the risk associated with exposure to the PCB-contaminated soils, sediments, and paper residuals ("residuals") of the KHL-OU3 and the five former lagoons.

This RA will address the risk posed by the PCB-contaminated materials in the five former lagoons and the KHL-OU3 by controlling the current and potential exposure and migration pathways that would present a risk or cause a release of PCB contamination to the Kalamazoo River. The RA addresses the following migration pathways from the KHL-OU3: release of leachate to groundwater, surface water, and surface sediments; and the release of PCB-contaminated residuals/soils to surface water by erosion, surface run-off, and berm failure. For the five former lagoons the RA will address the following migration pathways: direct release of PCB-contaminated residuals/soils to surface water by erosion and surface run-off.

The major components of the RA include: the construction of a cover and containment system on the King Highway Landfill ("KHL") and excavation of PCB-contaminated soils, sediments, and residuals from the King Street Storm Sewer ("KSSS") floodplain, the five former lagoons and their floodplain, and the Kalamazoo River directly adjacent to the KHL. Subject to the approval of the MDEQ and the EPA, it is anticipated that Millenium Holdings, Inc. will excavate residuals and soils from two lagoons at the former Allied Paper, Inc. King Mill property (the "King Mill Lagoons residuals and soils"). All of the excavated soils, sediments, and residuals will be consolidated in the KHL prior to construction of the cover, provided, however, that Georgia Pacific is under no obligation to delay construction of the cover in the event that Millenium Holdings, Inc. is unable to transport the King Mill Lagoons residuals and soils to the KHL in accordance with

the RA Construction Schedule. Most but not all of the PCB contamination being excavated during this RA is believed to be associated with the gray clay paper residuals. For that reason, the first action during all excavation activities will be to excavate all visible gray clay paper residuals and all visible gray clay paper residuals mixed with soil and/or sediment ("visible PCB-contaminated residuals, soil, and sediment") from the KSSS floodplain, the five former lagoons, and the Kalamazoo River that is directly adjacent to the KHL. This procedure will also be applied to the King Mill lagoons and any other excavation area that the MDEQ deems necessary. These excavations of the visible PCB-contaminated residuals, soil, and sediment will be followed by confirmation sampling as described below for each specific area. More specifically, the components of the RA include the following:

A. The construction of a cover ("cap") over the KHL will minimize infiltration of precipitation through the KHL and prevent potential migration of PCBs from the KHL into the Kalamazoo River. The cap will also prevent exposure to the PCBs via direct contact, inhalation, and/or ingestion. The cap is designed to meet the Michigan Solid Waste Landfill closure regulations pursuant to Part 115, Solid Waste Management, of the Michigan Natural Resources and Environmental Protection Act, 1994 PA 451, as amended ("NREPA"). The cap consists of the following components from bottom to top:

    - A gas venting layer shall be installed, over the entire surface of the KHL, consisting of at least a six-inch thick, select granular fill layer. This gas venting layer is designed to collect landfill gas and route it to a passive venting system. Select granular fill from an off-site source, having a minimum hydraulic conductivity of 1×10^{-3} centimeters per second, will be used to construct the layer. The gas venting system will consist of 19 passive gas vents placed in the select granular fill. Excessive gas generation is not anticipated due to the type and age of the residuals.

- At least a 30-mil thick flexible membrane liner ("FML") shall be placed over the select granular fill. The FML will act as a barrier layer to minimize infiltration of precipitation into the residuals.

- At least a 24-inch thick general fill layer ("protective layer") shall be placed above the 30-mil FML. The protective layer will be capable of sustaining the growth of non-woody plants, will have adequate water holding capacity, and will be sufficiently thick to allow for erosion losses. The water that accumulates within this layer will drain directly to the river, to a ditch, or to a sedimentation outlet structure that subsequently discharges into the Kalamazoo River. All water discharging from the KHL shall be in compliance with water quality standards of Part 31, Water Resources Protection, of the NREPA.

- At least a six-inch thick vegetative layer ("erosion layer") shall be placed and maintained over the protective layer. The erosion layer has been designed to promote vegetative growth, provide surface water runoff, and minimize erosion.

B. Erosion protection shall be placed on the berms of the landfill. This protection will be sufficient to protect the berms from a 100-year flood event. At a minimum, all erosion protection shall extend 2 feet above the 100-year flood elevation. Part of this erosion protection will be provided by a steel sheet piling stabilization wall present between the Kalamazoo River and the berms of Cells 1 and 2. The length of the wall is 1,020 feet and it is located on the north side of the landfill. It extends from the most northern point of Cell 1, southeast along the perimeter of Cells 1 and 2, to the junction where the corners of Cells 2, 3, and 4 meet. At this point the steel sheet pile wall ties into a berm where a synthetic mat has been placed under a stone facing to provide erosion protection.

C. Long-term groundwater monitoring shall be performed in perpetuity following the completion of the RA as may be necessary to protect the public health, safety, or welfare, or the environment and to assure the effectiveness and integrity of the RA. Monitoring of the groundwater aquifer under the landfill will be conducted in accordance with Part 115, Solid Waste Management, and Part 201, Environmental Remediation, of the NREPA. All requirements for groundwater monitoring shall be specified in the Hydrogeologic Monitoring Plan ("HMP") approved by the MDEQ.

D. The visible PCB-contaminated residuals, soils, and sediment from the KSSS floodplain adjacent to the KHL will be excavated and consolidated into the KHL. Upon completion of the excavation, verification sampling will be conducted pursuant to the MDEQ's Guidance Document Verification of Soil Remediation (April 1994). If a cleanup level of 1.0 part per million (ppm) or lower is achieved, the action will be accepted as a final RA. If the sampling shows that the excavation has achieved a cleanup level of 1.0 ppm or lower, the excavated area will be backfilled with a minimum of 12 inches of clean soil and vegetated. Soil erosion control measures will also be implemented. If verification sampling shows that 1.0 ppm has not been achieved, Georgia-Pacific will propose, within 45 days of the MDEQ's receipt of the verification sampling data, specific additional actions, including an implementation schedule that will be taken to achieve the appropriate state cleanup criteria.

E. The visible PCB-contaminated residuals and sediment from the Kalamazoo River directly adjacent to the KHL shall also be excavated and consolidated into the KHL. The maximum distance out into the Kalamazoo River that Georgia-Pacific must excavate is 50 feet from the

edge of the river of the KHL. For the purposes of this activity the edge of the river is at elevation 755 msl (feet above mean sea level). This action is an interim response action and excavation will be done using visual criteria. The MDEQ oversight person will determine to what extent excavation is necessary within this area of the Kalamazoo River. The focus of this action will be to consolidate residuals waste masses that extend into the river adjacent to the KHL. Once the sampling has verified that all visual residuals have been removed, the excavated area will be backfilled with a minimum of 12 inches of suitable clean material. Sediment erosion control measures will also be implemented pursuant to the ESCP.

F. The visible PCB-contaminated residuals and soil shall be excavated from the five former lagoons and placed into the KHL. The five former lagoons will be excavated down to native soils to achieve a cleanup level of 9.9 ppm or lower. Upon completion of the excavation, Georgia-Pacific will conduct verification sampling pursuant to the MDEQ's Guidance Document Verification of Soil Remediation (April 1994). All verification samples shall be analyzed for total PCBs and ten percent of the verification samples shall be analyzed for the complete EPA Contract Laboratory Program's ("CLP") Target Compound List/Target Analyte ("TCL/TAL") Compound List. Method of Detection Limits for the analysis will be those specified in the Part 201 of the NREPA Target Method Detection Limits ("TMDLs"). Once the sampling has verified that the excavation has achieved a cleanup level of 9.9 ppm or lower the excavated area will be backfilled with a minimum of 12 inches of clean soil and vegetated.

G. The visible PCB-contaminated residuals, soils, and sediment shall be excavated from the floodplain adjacent to the five former lagoons to a

maximum distance of 10 feet from the edge of the river. For the purposes of this activity the edge of the river is at elevation 755 msl. This action is an interim response action. The excavated materials will be placed in the KHL. Post excavation sampling shall be conducted prior to backfilling and vegetation. The samples shall be analyzed for total PCBs and ten percent of the samples shall be analyzed for the complete EPA CLPs TCL/TAL. Method of Detection Limits for the analysis will be those specified in the Part 201 of the NREPA TMDLs. Once all visual residuals have been removed and the sampling has been completed, the excavated area will be backfilled with a minimum of 12 inches off suitable clean material and vegetated. Soil erosion control measures will also be implemented pursuant to the ESCP.

H. Subject to the approval of the MDEQ and the EPA, it is anticipated that Millenium Holdings, Inc. will excavate residuals and soils from two lagoons at the former Allied Paper, Inc. King Mill property and that Millenium Holdings, Inc. will transport the King Mill lagoons residuals and soils to the KHL prior to the construction of the cover. If the MDEQ and EPA approve, and Millennium Holdings, Inc. implements the excavation, in accordance with the RA construction schedule, Georgia-Pacific shall consolidate and contain the King Mill lagoon visibly identifiable residuals and soils in the KHL under the cover pursuant to the ROD and this SOW.

K. Access restrictions and site security shall be implemented at the KHL to prevent unauthorized access and vandalism to the KHL. This shall include enclosing the entire KHL with a fence that shall border the KHL where physical barriers do not currently exist. The exact location of the fencing will be approved by the MDEQ. Fencing of the KHL shall consist of a chain link fence around the perimeter, which is a minimum six feet high with a minimum three-strand barbed wire. Warning signs shall be

posted at 200-feet intervals along the fence and at all entry gates. The warning signs shall advise that the area is hazardous due to PCBs in buried paper-making residuals. The signs shall also provide a telephone number to call for further information. The fence shall be installed prior to submitting the Notice of Completion of Construction. These requirements are necessary to protect the public health, safety, or welfare, or the environment and to assure the effectiveness and integrity of the RA.

L. Long-term Operation and Maintenance shall be performed in accordance with Part 20120b(3) of NREPA to assure the effectiveness and integrity of the RA.

III. PERFORMANCE STANDARDS FOR INSTALLATION AND OPERATION OF MONITORING PROGRAM FOR RA

Georgia-Pacific shall implement monitoring program(s) to evaluate and ensure that the construction and implementation of the RA comply with approved plans and design documents and performance standards. All analytical results shall be provided to the MDEQ no later than 60-days after collection. Georgia-Pacific shall submit monitoring programs as part of the RD, which shall address the specific components of the RA and the work to be conducted during the RD.

A. Groundwater Monitoring

Long-term groundwater monitoring shall be performed in perpetuity following OU capping or until the MDEQ determines that long-term groundwater monitoring is no longer necessary to protect public health, saftey, or welfare, or the environment and to assure the effectiveness and integrity of the remedial action. Monitoring of the groundwater aquifer

under the landfill will be conducted in accordance with Part 115 and Part 201 of the NREPA, at a minimum. Long-term groundwater monitoring shall be performed following the completion of the RA to protect the public health, safety, or welfare, or the environment and to assure the effectiveness and integrity of the RA. Concentrations of hazardous substances in groundwater must comply with Part 201 of the NREPA. This groundwater monitoring system will be developed in the RD as specified in the HMP, and well decommissioning procedures will follow the MDEQ-approved Field Sampling Plan ("FSP") (July 1993).

B. Long-Term Monitoring Locations

In order to monitor and evaluate the RAs throughout the OU, groundwater monitoring wells shall be installed at locations to be identified in the HMP. All of these wells shall be considered as groundwater monitoring points and will be sampled to gauge compliance with groundwater criteria under Part 201 of the NREPA. If any of the wells are destroyed or in any way become unusable, Georgia-Pacific shall repair or replace each well. The frequency of sampling and sampling parameters are listed in the HMP.

C. Air

During construction of the RA, Georgia-Pacific shall ensure, at a minimum, that total emissions from the entire site shall comply with the Secondary Rick Screening Level ("SRSL") for PCB, development pursuant to rules of Part 55, Air Pollution Control, of Act 451 of 1994, NREPA, as amended. The SRSL for PCB based upon an incremental cancer risk of 1 in 100,000 is 0.02 ug/m3 (micrograms per cubic meter) applied at the site perimeter. At a site perimeter location where the adjacent property is an industrial property or a public roadway, Rule 225(3) b allows for compliance with the

SRSL multiplied by a factor of 10. Where the adjacent property is not an industrial property or public roadway, the site perimeter location shall comply with the SRSL. If air emissions exceed this level, Georgia-Pacific shall notify the MDEQ within 24 hours and take corrective measures identified in the Health and Safety Plan ("HASP"). The Air Monitoring Plan shall be approved by the MDEQ.

D. Water Discharge Treatment System Monitoring

For any discharge of water to the Kalamazoo River from the temporary water treatment system identified in the ROD, Georgia-Pacific shall conduct short-term monitoring in accordance with the MDEQ's SRD. The monitoring program shall be designed to detect any conditions that may interfere with the proper operation and function of the temporary water treatment system. System monitoring shall include collection and field/laboratory analysis of effluent samples to determine the effectiveness of the treatment system for pretreatment prior to discharge. Sampling shall occur on a regular basis, for the period in which the system is operating. Georgia-Pacific shall follow the sampling procedures and frequencies established in the SRD. The monitoring plan for the temporary water treatment system shall be contained in the RD work plan.

E. Monitoring of surface water discharged during dewatering will be conducted as required by the MDEQ's Substantive Requirements Document ("SRD").

F. Surface water monitoring shall be conducted during the excavation of materials from the Kalamazoo River, the KSSS floodplain, and the floodplain of the five former lagoons. The monitoring shall be conducted in accordance with a surface water monitoring plan approved by the MDEQ.

IV. SCOPE OF RD AND RA

The RD/RA shall consist of four tasks. All plans are subject to MDEQ approval.

A. Task 1: RD Work Plan

B. Task 2: RD Phases
   1. Preliminary Design
   2. Intermediate Design
   3. Prefinal Design/Final Design

C. Task 3: RA Construction
   1. Preconstruction Inspection and Meeting
   2. Construction of the RA
   3. Prefinal Inspection
   4. Final Inspection
   5. Certification and Completion of Construction

D. Task 4: Operation and Maintenance ("O&M")
   1. Post Closure O&M
   2. Performance Monitoring

A. Task 1: RD Work Plan

Georgia-Pacific shall submit an RD Work Plan which shall document the overall management strategy for performing the design, construction, operation, maintenance and monitoring of RA for MDEQ review and approval. The RD Work Plan shall document the responsibility and authority of all organizations and key personnel involved with the

implementation and shall include a description of qualifications of key personnel directing the RD, including contractor personnel. The RD Work Plan shall also contain a schedule of RD activities.

B. Task 2: RD Phases

Georgia-Pacific shall prepare construction plans and specifications to implement the RA at the KHL-OU3, the five former lagoons and, as necessary, the King Mill lagoons as described in the ROD and this SOW. Plans and specifications shall be submitted in accordance with the schedule set forth in Section H below. Subject to approval by the MDEQ, Georgia-Pacific may submit more than one set of design submittals reflecting different components of the RA. All plans and specifications shall be developed in accordance with EPA's Superfund Remedial Design and Remedial Action Guidance (OSWER Directive No. 9355.0-4A) and shall demonstrate that the RA shall meet all objectives of the ROD, the AOC, and this SOW, including all performance standards. Georgia-Pacific shall meet regularly with the MDEQ to discuss design issues.

1. *Preliminary Design*

Georgia-Pacific shall submit the Preliminary Design when the design effort is approximately 30 percent complete. The Preliminary Design submittal shall include or discuss, at a minimum, the following:

Preliminary plans, drawings, and sketches, including design calculations;
Results of treatability studies and additional field sampling;
Design assumptions and parameters, including design restrictions,

process performance criteria, appropriate unit processes for the treatment train, and expected removal or treatment efficiencies for both the process and waste (concentration and volume);
Proposed cleanup verification methods, including compliance with ARARs;
Outline of required specifications;
Proposed siting/locations of process/construction activity;
Expected long-term monitoring and operation requirements;
Real estate, easement, and permit requirements and;
Preliminary construction schedule, including contracting strategy.

2. *Intermediate Design*

Georgia-Pacific shall submit the Intermediate Design when the design effort is approximately 60 percent complete. The Intermediate Design shall fully address all comments made to the preceding design submittal. The Intermediate Design submittal shall include those elements listed for the Preliminary Design, as well as the following:

Draft Engineering Design Report;
Draft Construction Quality Assurance Plan ("CQAP");
Draft HASP;
Draft ESCP;
Draft HMP;
Performance Standard Verification Plan;
Quality Assurance Project Plan ("QAPP");
FSP;
CQAP;
HMP;

Landfill Gas Monitoring Plan ("LGMP").
Surface Water Monitoring Plan ("SWMP")

3. *Prefinal and Final Designs*

Georgia-Pacific shall submit the Prefinal Design when the design effort is 95 percent complete and shall submit the Final Design when the design effort is 100 percent complete. The Prefinal Design shall fully address all MDEQ comments made to the preceding design submittal. The Final Design shall fully address all MDEQ comments made to the Prefinal Design and shall include reproducible drawings and specifications suitable for bid advertisement. The Prefinal Design shall serve as the Final Design if the MDEQ has no further comments and issues the notice to proceed.

The Prefinal and Final Design submittals shall include those elements listed for the Intermediate Design as well as the following:

Final SWMP;
Final QAPP;
Final Engineering Design Report;
Final LGMP;
Final CQAP;
Final HASP;
Final ESCP;
Final HMP; and
Final Project Schedule for the construction and implementation of the RA which identifies timing for initiation and completion of all

critical path tasks. The final project schedule submitted as part of the Final Design shall include specific dates for completion of the project and major milestones.

C. Task 3: RA Construction

Georgia-Pacific shall implement the RA as detailed in the approved Final Design. The following activities shall be completed in constructing the RA.

1. Preconstruction Inspection and Meeting

Georgia-Pacific shall participate with the MDEQ in a preconstruction inspection and meeting to:

a. Review methods for documenting and reporting inspection data;
b. Review methods for distributing and storing documents and reports;
c. Review work area security and safety protocol;
d. Discuss any appropriate modifications of the CQAP to ensure that site-specific considerations are addressed; and
e. Conduct a site walk-around to verify that the design criteria, plans, and specifications are understood and to review material and equipment storage locations.

The preconstruction inspection and meeting shall be documented by a designated person and minutes shall be transmitted to all Parties.

2. Construction of RA

The RA shall be implemented in accordance with approved final Project schedules. The construction phase of the RA includes the removal and consolidation of PCB residuals into the KHL, construction of the landfill cap over Cells 1 through 4, and installation of the monitoring system.

3. *Prefinal Inspection*

Within 15 working days after Georgia-Pacific makes a preliminary determination that construction is complete, Georgia-Pacific shall notify the MDEQ for the purposes of conducting a prefinal inspection. The prefinal inspection shall consist of a walk-through inspection of the entire KHL-OU and the five former lagoons with the MDEQ. The inspection is to determine whether the project is complete and consistent with the contract documents and the RA. Any outstanding construction items discovered during the inspection shall be identified and noted. Georgia-Pacific shall prepare a prefinal inspection that outlines the outstanding construction items, actions required to resolve items, completion date for these items, and a proposed date for final inspection.

4. *Final Inspection*

Within 15 working days after completion of any work identified in the prefinal inspection report, Georgia-Pacific shall notify the MDEQ for the purpose of conducting a final inspection. The final inspection shall consist of a walk-through inspection of the KHL-OU and the five former lagoons by the MDEQ and Georgia-Pacific. The prefinal inspection report shall be used as a checklist with the

final inspection focusing on the outstanding construction items identified in the prefinal inspection. Confirmation shall be made that outstanding items have been resolved.

5. *Construction Completion Report*

Thirty days after a successful final inspection, Georgia-Pacific shall submit a draft Final Report for Completion of Construction to the MDEQ. The construction phase includes the removal and consolidation of PCB residuals into the KHL, construction of the landfill cap over Cells 1 through 4, and installation of the monitoring system. The draft Final Report for Completion of Construction shall summarize all response activities performed under the AOC relating to the construction phase. In the report, a registered professional engineer and Georgia-Pacific's Project Coordinator shall state that the construction has been completed in full satisfaction of the requirements of the AOC. The draft Final Report for Completion of Construction shall include or reference any supporting documentation. The report shall also contain the following statement, signed by a responsible corporate official of Georgia-Pacific or Georgia-Pacific's Coordinator: "To the best of my knowledge, after thorough investigation, I certify that the information contained in or accompanying this submission is true, accurate, and complete. I am aware there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations." The report shall be submitted with the Notification of Completion of Construction to the MDEQ.

D. Task 4: O&M

Post-Closure O&M

Georgia-Pacific shall prepare a final Post-Closure O&M Plan ("O&M Plan") to cover both implementation and long-term maintenance of the RA. A draft O&M Plan shall be submitted as a final design document submission. The final plan shall be submitted to the MDEQ prior to the pre-final construction inspection, in accordance with the approved construction schedule. The plan shall be composed of the following elements:

1. *Description of Post-Closure O&M Plan*

    a. Description of tasks for closure;
    b. Description of tasks for post-closure care;
    c. Description of prescribed treatment or operation conditions; and
    d. Schedule showing frequency of each O&M task.

2. *Description of Potential Closure Problems*

    a. Description and analysis of potential closure problems;
    b. Sources of information regarding problems; and
    c. Common and/or anticipated remedies.

3. *Description of Routine Monitoring and Laboratory Testing*

    a. Description of monitoring tasks;
    b. Description of required data collection, laboratory tests, and their interpretation;
    c. Required quality assurance and quality control;
    d. Schedule of monitoring frequency and procedures for a petition to the MDEQ to reduce the frequency of or discontinue monitoring; and

e. Description of verification sampling procedures if performance standards are exceeded in routine monitoring.

4. *Description of Alternate O&M*

a. Should systems fail, describe alternate procedures to prevent release or threatened releases of hazardous substances, pollutants, or contaminants which may endanger public health and the environment or exceed performance standards; and

b. Analysis of vulnerability and additional resource requirement should a failure occur.

5. *Corrective Action*

a. Description of corrective action to be implemented in the event performance standards are exceeded; and

b. Schedule for implementing these corrective actions.

6. *Safety Plan*

a. Description of precautions, necessary equipment, etc., for site personnel; and

b. Safety tasks required in event of systems failure.

7. *Description of Equipment*

a. Equipment identification;

b. Installation of monitoring components.

c. Maintenance of site equipment; and

d. Replacement schedule for equipment and installed components.

8. *Description of Records and Reporting Mechanisms Required*

a. Laboratory records;
b. Records for closure costs;
c. Mechanisms for reporting emergencies;
d. Personnel and post-closure care records; and
e. Monthly/annual reports to state agencies.

Performance Monitoring

Performance monitoring shall be conducted to ensure that all Performance Standards are met to protect the public health, safety, or welfare, or the environment and to assure the effectiveness and integrity of the RA.

1. *Performance Standard Verification Plan*

The purpose of the Performance Standard Verification Plan is to provide a mechanism to ensure that both short-term and long-term Performance Standards for the RA are met. The Draft Performance Standards Verification Plan shall be submitted with the Intermediate Design. Once approved, the Performance Standards Verification Plan shall be implemented on the approved schedule. The Performance Standards Verification Plan shall include:

QAPP
HASP (including the Air Monitoring Plan)
FSP

CQAP

HMP

LGMP

ESCP (including the SWMP)

V. CONTENT OF SUPPORTING PLANS

The documents listed in the Performance Standard Verification Plan - the QAPP, FSP, HASP, CQAP, HMP, LGMP, and ESCP - are documents which must be prepared and submitted as outlined in Section IV of this SOW. The following sections describe the required contents of each of these supporting plans.

A. QAPP

In the event that additional sampling for chemical analysis is needed to support completion of the RD/RA phase, Georgia-Pacific will use the QAPP, which was approved by the MDEQ in June 1993, to govern sample collection, handling, custody, transport, and analysis. If methods of sampling and analysis not covered by the June 1993 QAPP are necessary, an addendum to the QAPP will be submitted to the MDEQ for approval. In conjunction with the KHL-OU FSP, approved by the MDEQ in July 1993, the QAPP provides details on sampling objectives, field sampling and laboratory analytical procedures for each matrix being sampled, sample handling and documentation requirements, and field and laboratory quality assurance/quality control procedures. The Part 201 of the NREPA TMDL will be met for all sample analysis and all analytical results will be submitted to the MDEQ no later than 30 days after sample has been collected. The QAPP shall be consistent with the requirements of the EPA CLP for laboratories proposed outside the CLP. The QAPP shall at a minimum include:

1. Project Description
    a. Facility Location History
    b. Past Data Collection Activity
    c. Project Scope
    d. Sample Network Design
    e. Parameters to be Tested and Frequency
    f. Project Schedule

2. Project Organization and Responsibility

3. Quality Assurance Objective for Measurements Data
    a. Level of Quality Control Effort
    b. Accuracy, Precision, and Sensitivity of Analysis
    c. Completeness, Representativeness, and Comparability

4. Sampling Procedures

5. Sample Custody
    a. Field Specific Custody Procedures
    b. Laboratory Chain of Custody Procedures

6. Calibration Procedures and Frequency
    a. Field Instruments/Equipment
    b. Laboratory Instruments

7. Analytical Procedures
    a. Non-Contact Laboratory Program Analytical Methods
    b. Field Screening and Analytical Protocol
    c. Laboratory Procedures

8. Internal Quality Control Checks
    a. Field Measurements
    b. Laboratory Analysis

9. Data Reduction, Validation, and Reporting
    a. Data Reduction
    b. Data Validation
    c. Data Reporting

10. Performance and System Audits
    a. Internal Audits of Field Activity
    b. Internal Laboratory Audit
    c. External Field Audit
    d. External Laboratory Audit

11. Preventative Maintenance
    a. Routine Preventative Maintenance Procedures and Schedules
    b. Field Instruments/Equipment
    c. Laboratory Data

12. Specific Routine Procedures to assess Data Precision, Accuracy, and Completeness
    a. Field Measurement Data
    b. Laboratory Data

13. Corrective Action
    a. Sample Collection/Field Measurement
    b. Laboratory Analysis

14. Quality Assurance Reports to Management

B. HASP

1. Georgia-Pacific's consultants or contractors shall develop a HASP which is designed to protect on-site personnel and area residents from physical, chemical, and other hazards posed by this RA. The safety plan shall develop the performance levels and criteria necessary to address the following areas:

   a. Facility Description
   b. Personnel
   c. Levels of Protection
   d. Safe work practices and safe guards
   e. Medical surveillance
   f. Personal and environmental air monitoring
   g. Personal protection equipment
   h. Personal hygiene
   i. Decontamination - personal and equipment
   j. Site work zones
   k. Contaminant control
   l. Logs, reports, and record keeping
   m. Contingency and emergency planning

2. The Contingency and Emergency Planning chapter of the HASP shall include, at a minimum, the following:

   a. Name of the person or entity responsible for responding in the event of an emergency incident.
   b. Plan and date(s) for meetings with the local community, including local, state, and federal agencies involved in the cleanup, as well as local emergency squads and hospitals.

c. First aid medical information.

d. Air Monitoring Plan.

e. Spill Prevention, Control, and Countermeasures Plan, as specified in 40 CFR Part 109 describing measures to prevent and contingency plans for potential spills and discharge from material handling and transportation.

The safety plan shall follow EPA guidance and all OSHA requirements as outlined in 29 CFR Parts 1910 and 1926.

C. FSP

The KHL-OU3 Remedial Investigation/Feasibility Study ("RI/FS") FSP supplements the QAPP and addresses all sample collection activities. Georgia-Pacific shall modify the MDEQ-approved KHL-OU3 RI/FS FSP (as described in "Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA," October 1988) to include all sampling activities to be conducted. All modifications to the KHL-OU3 RI/FS FSP must be submitted to the MDEQ for review and approval.

D. CQAP

Georgia-Pacific shall submit a CQAP describing the site-specific components of the quality assurance program, which shall ensure that the completed project meets or exceeds all design criteria, plans, and specifications. The draft CQAP shall be submitted with the prefinal design and the final CQAP shall be submitted with the final design. The CQAP shall contain, at a minimum, the following elements:

1. Responsibilities and authorities of all organizations and key personnel involved in the design and construction of the RA.

2. Qualifications of the Quality Assurance Official to demonstrate he possesses the training and experience necessary to fulfill his identified responsibilities.
3. Protocols for sampling and testing used to monitor construction.
4. Identification of proposed quality assurance sampling activities including the sample size, locations, frequency of testing, acceptance and rejection data sheets, problem identification and corrective measures reports, evaluation reports, acceptance reports, and final documentation. A description of the provisions for final storage of all records consistent with the requirements of the Consent Decree shall be included.
5. Reporting requirements for Construction Quality Assurance activities shall be described in detail in the CQAP. This plan shall include such items as daily summary reports, inspection data sheets, problem identification and corrective measure reports, design acceptance reports, and final documentation. Provisions for the final storage of all records shall be presented in the CQAP.

E. HMP

Georgia-Pacific shall develop a HMP to monitor groundwater conditions at the KHL of the KHL-OU3. The HMP will include information related to sampling locations, constituents to be analyzed, sampling and analytical procedures, and procedure for analyzing data. The HMP shall describe the groundwater monitoring system, consisting of wells capable of yielding groundwater from the uppermost aquifer and providing a means to obtain representative samples of hydraulically upgradient and downgradient groundwater. The design, operation, maintenance, and decommissioning of monitoring wells included in the groundwater monitoring program shall conform with Part 201 and Part 115 of the NREPA. Groundwater

sampling and analysis procedures shall be performed in accordance with the requirements of Part 115 and Part 201 of NREPA including provisions for sample collection, preservation, documentation, and shipping, sample analysis, and equipment decontamination. Thirty-days affer each sampling event a report will be submitted to the MDEQ by Georgia Pacific.

F. LGMP

Georgia-Pacific shall submit a LGMP which describes procedures to monitor for gas generation.

The LGMP will describe the Gas Monitoring System, which will include:

Monitoring locations;
Monitoring schedule;
Monitoring procedures;
Reporting procedures and contingency actions; and
Monitoring system maintenance.

G. ESCP

Georgia-Pacific will prepare an ESCP to detail how the design will control the production and potential migration of soil and sediment beyond the limits of disturbance. The ESCP is to include provision for controlling erosion and sediment loading by installing and maintaining temporary and permanent erosion control features such as silt fences, silt curtains, erosion control blankets, check dams, diversion berms, drainage ditches, sedimentation facilities, vegetative stands, ground cover, and stream bank protection, as necessary. In addition, the ESCP will detail appropriate measures for preventing potential erosion resulting from wind, such as

controlling the moisture content of erodible materials and installing silt fencing.

The Engineering Design Report ("EDR") and/or ESCP shall detail how surface water runoff and stormwater will be managed during and after the RA. At a minimum the EDR and the ESCP shall meet the stormwater and sedimentation regulations of the NREPA. Stormwater management plans must include provision for control of stormwater runoff during the construction phase and shortly thereafter to reduce the potential for erosion of recently placed subgrade materials and areas recently disturbed due to construction activities. Temporary control measures may include those provided for in the ESCP. Permanent stormwater management measures will facilitate the conveyance of stormwater from the site in a controlled manner to reduce the potential for erosion of vegetated and protected slopes and final grades.

The ESCP will include construction drawings detailing where temporary erosion control and stormwater management measures will be installed during construction, and where permanent measures will be established to control stormwater runoff and erosion after the RA is complete. A preliminary ESCP (approximately 35 percent complete) will be submitted to the MDEQ for review and approval in conjunction with the development, review, and approval of the EDR.

H. Summary of Major Deliverables/Schedule

A summary of the project schedule and reporting requirements contained in this SOW is presented below:

DELIVERABLES/MILESTONES		DUE DATE
1.	Submit RD Work Plan	Within thirty (30) days after the effective date of the AOC.
2.	Submit Preliminary Design (30 percent)	Within thirty days after receipt of MDEQ's approval of the RD Work Plan.
3.	Submit Intermediate Design (60 percent)	Within thirty (30) days after receipt of MDEQ's approval of the Preliminary Design.
4.	Submit Prefinal Design (95 percent)	Within thirty (30) days after receipt of MDEQ's comments on the Intermediate Design.
5.	Submit Final Design (100 percent)	Within thirty (30) days after receipt of MDEQ's comments on the Prefinal Design.
6.	Award RA Contract(s)	Within thirty (30) days after entry of the AOC.
7.	Conduct Pre-Construction Inspection and Meeting	Within fifteen (15) days after award of RA Contract(s)
8.	Initiate Construction of RA	Within thirty (30) days after Pre-construction Inspection and Meeting.
9.	Completion of Construction	As approved by the MDEQ in the RA construction schedule.
10.	Conduct Prefinal Inspection	No later than fifteen (15) days after completion of construction.
11.	Submit Prefinal Inspection Report	Within sixty (60) days after completion of prefinal inspection.
12.	Submit Final O&M Plan	No later than Prefinal Inspection.
13.	Submit Final Inspection	Within fifteen (15) days after completion of work identified in prefinal inspection report.
14.	Submit Construction Completion Report	Within thirty (30) days after Final Inspection.

ATTACHMENT 5

DECLARATION OF RESTRICTIVE COVENANT

MDEQ Reference No.: RC-ERD-99-010

This Restrictive Covenant has been recorded with the Kalamazoo Register of Deeds for the purpose of protecting public health, safety and welfare and the environment.

Georgia-Pacific Corporation has signed an Administrative Order by Consent for Response Activity (AOC-ERD-99-010) with the Michigan Department of Environmental Quality (MDEQ) to implement the response activities set forth in the statement of work that is attached to AOC-ERD-99-010 (Response Activities). The Response Activities will be performed at property located in the City of Kalamazoo, of Kalamazoo, County of Michigan, (Property) more particularly described as:

Commencing at the intersection of the North line of King Highway and the North and South ¼ line of Section 23, T. 2 S., R. 11 W.; thence South 85°-49' East, 930.31 feet for the place of beginning of the land hereinafter described; thence North 50°-31'-30" West, 133.43 feet to the Easterly right-of-way line of the former CK&S Railroad; thence on a non-tangent curve to the left along said right-of-way, 334.21 feet; thence continuing on a curve to the left, along said right-of-way, 465.50 feet; thence South 43°-24' East, 165 feet, more or less, to the intersection of the East line of the former Upjohn Avenue; thence North 0°-35'-47" East thereon to the Westerly bank of the Kalamazoo River; thence upstream along the Southerly and Westerly bank of said River to the North right-of-way line of King Highway; thence North 85°-49' West thereon, 1,045 feet, more or less, to the place of beginning.

See Attachment A for a survey of the Property subject to land-use restrictions and delineates the Limit of Waste

Property Tax ID Numbers of Property: 3906-23-240-030, 0058520, and 005824

As used herein, the term "Owner" shall mean at any given time the then current titleholder of the Property.

NOW THEREFORE Georgia-Pacific Corporation, 2425 King Highway, Kalamazoo, Michigan 49001, pursuant to Section 20120b(4) of NREPA and the Administrative Order by Consent for Response Activity entered by and between Georgia-Pacific Corporation and the MDEQ (AOC-ERD-99-010), hereby imposes restrictions on the Property and covenants and agrees that:

1. The Owner shall restrict the uses of the Property to those uses compatible with the Response Activities

2. The Owner shall restrict activities at the Property that may interfere with the Response Activities, and with the operation and maintenance, monitoring, or other measures necessary to assure the effectiveness and integrity of the Response Activities.

3. The Owner shall restrict activities at the Property that may result in exposures above levels established in the Statement of Work that is attached to AOC-ERD-99-010 (Statement of Work). The restricted activities include:

a. Prohibition of groundwater well installation and groundwater use within the property boundary for all uses. The groundwater restriction applies to all waterbearing aquifers within the Property boundary.

b. Prohibit excavation of soils or residuals within the Property boundary, unless this excavation is conducted as part of the necessary maintenance and personnel are properly trained according to 29 CFR 1910.120. Any excavated areas within the Property boundary must have the cap restored to its original specifications within fourteen (14) days or other such time frame as approved by the state. Any soils removed from excavation must comply with Part 201 of the NREPA. Excavation of soils or residuals within the Property boundary must be reviewed and approved by the MDEQ regarding compliance with ARARs prior to excavation.

c. Prohibition of construction of any structure within the Property boundary.

4. The Owner shall provide notice to the MDEQ of the Owner's intent to convey any interest in the Property fourteen (14) days prior to consummating the conveyance. A conveyance of title, an easement, or other interest in the Property shall not be consummated by the Owner without adequate and complete provision for compliance with the terms and conditions of this Restrictive Covenant.

5. The Owner shall grant to the MDEQ and its designated representatives the right to enter the Property at reasonable times for the purpose of determining and monitoring compliance with theStatement of Work, including the right to take samples, inspect the operation of the Response Activities measures and inspect records.

6. The Owner shall install permanent markers that have been approved by the MDEQ on each side of the Property which describe the restricted area and the nature of the prohibitions specified in the provisions of number 2 above and include the liber and page number of this Restrictive Covenant as recorded in the Kalamazoo County Register of Deeds.

The Owner also acknowledges that surface and subsurface soils found on the Property must be managed in accordance with the requirements of Section 20120c of NREPA and other applicable state and federal laws.

The State of Michigan may enforce the restrictions set forth in this Restrictive Covenant by legal action in a court of appropriate jurisdiction.

This Restrictive Covenant shall run with the Property and shall be binding upon all future owners, successors, lessees or assigns and their authorized agents, employees, or persons acting under their direction and control, and shall continue until the MDEQ or its successor approves modifications or rescission of this Restrictive Covenant. A copy of this Restrictive Covenant shall be provided to all future owners, heirs, successors, lessees, assigns and transferees by the person transferring the interest.

If any provision of this Restrictive Covenant is held to be invalid by any court of competent jurisdiction, the invalidity of such provision shall not affect the validity of any other provisions hereof. All such other provisions shall continue unimpaired in full force and effect.

The undersigned person executing this Restrictive Covenant is the Owner, or has the express written permission of the Owner, and represents and certifies that he or she is duly authorized and has been empowered to execute and deliver this Restrictive Covenant.

IN WITNESS WHEREOF, the said Owner of the above-described Property has caused this Restrictive Covenant to be executed on this ___ day of _____, 20__.

_____
Georgia-Pacific Corporation
2425 King Highway
Kalamazoo, Michigan 49001

Signed in the presence of:

_____ _____
Witness _____ Witness _____
[Print or type name] [Print or type name]

STATE OF _____
COUNTY OF _____
[county where owner signs]

The foregoing instrument was acknowledged before me this _____, 20__ by _____ *[name of officer or agent, title of officer or agent]* of Georgia-Pacific Corporation, a Georgia Corporation, on behalf of the corporation.

_____
Notary Public

_____
[Print or type name]
_____ County, _____
[Commissioned in] *[State]*

My Commission Expires: _____

Prepared by: _____
[Type name of preparer]
_____
[Title and address]

DESCRIPTION:

Commencing at the intersection of the North line of King Highway and the North and South 1/4 line of Section 23, T. 2 S., R. 11 W.; thence South 85°-49' East, 930.31 feet for the place of beginning of the land hereinafter described; thence North 50°-31'-30" West, 133.43 feet to the Easterly right-of-way line of the former CK&S Railroad; thence on a non-tangent curve to the left along said right-of-way, 334.21 feet; thence continuing on a curve to the left, along said right-of-way, 465.50 feet; thence South 43°-24' East, 165 feet, more or less, to the intersection of the East line of the former Upjohn Avenue; thence North 0°-35'-47" East thereon to the Westerly bank of the Kalamazoo River; thence upstream along the Southerly and Westerly bank of said River to the North right-of-way line of King Highway; thence North 85°-49' West thereon, 1,045 feet, more or less, to the place of beginning.

CITY OF KALAMAZOO

KALAMAZOO RIVER

E. LINE, UPJOHN AVE.

S43°24'E, 165'±

N0°35'47"E

UPJOHN AVE.

PLAT OF RIVERSIDE

GRAND TRUNK R.R.

334.21'

SUPERIOR SALVAGE

DOSCA CONSTRUCTION

GEORGIA-PACIFIC

FLOW

GEORGIA-PACIFIC

N

0 25' 50' 100'

SCALE: 1" = 100'

NORTH & SOUTH 1/4 LINE, SECTION 23, T. 2 S., R. 12 W.

NORTH R.O.W. LINE, KING HIGHWAY

S85°49'00"E

930.31'

P.O.B.

N50°31'30"W

133.43'

251.98'

295.60'

S85°49'00"E

377.10'

1045'±

120'±

200'

KING HIGHWAY

GARTH N. BADEN, R.L.S. #10679

NOTES:

NO.	REVISIONS	BY	DATE
1	MISC. REVISIONS	RLS	12/11/98
2	MISC. REVISIONS	RLS	1/18/99

DRAWN: RLS
DATE: 7/1/96
CHECKED: GNB

Prein&Newhof
Engineers • Surveyors • Planners • Environmental Services
FORMERLY KNOWN AS WILKINS & WHEATON

PARTIAL BOUNDARY SURVEY
FOR
GEORGIA-PACIFIC CORPORATION

PROJECT NO. 990125K
SHEET NO.

990125K/DWG/990125K.dwg

ATTACHMENT 6

DRAFT

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY (MDEQ)
ENVIRONMENTAL RESPONSE DIVISION

Date: 7/13/99
Guidance Document
Appendices A, B, and C

SUBJECT: FINANCIAL ASSURANCE MECHANISMS (FAMs): THE FINANCIAL TEST

PURPOSE: This guidance document provides information on the use of the Financial Test as financial assurance mechanisms to meet the requirements of Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA). To use the Financial Test the person proposing the response activities must pass the test and provide the following to the MDEQ:

(1) A letter signed by the company's chief financial officer (CFO), which is worded in accordance with Appendix B of this guidance document, and which includes the Standard Financial Test provided in Appendix A.
(2) A copy of the company's year-end Annual Report for the past year.
(3) A special report from the company's independent certified public accountant to the company stating that he/she has compared the data in the CFO's letter (paragraph (1)) with the company's financial statements for the most recent fiscal year (paragraph (2)) and that no matters came to his/her attention which caused him/her to believe that the specific data was incorrect or should be adjusted. This report must be worded as provided in Appendix C of this guidance document.

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
ENVIRONMENTAL RESPONSE DIVISION

Guidance Document
Financial Assurance Mechanisms: The Financial Test
Appendix A

STANDARD FINANCIAL TEST

The figures for the following items marked with an (*) are to be derived from the company's independently audited, year-end financial statements for the latest fiscal year.

ALTERNATIVE I

1.	Sum of the current cost estimates for response activities needed at Michigan facilities, including the costs for operation and maintenance of remedial actions for the next thirty (30) year time period.	$$$$$$$$$
2.	Sum of the current cost estimates for response activities needed at non-Michigan facilities, including the costs for operation and maintenance of remedial actions.	$$$$$$$$$
3.	Sum of lines 1 and 2.	$$$$$$$$$
*4.	Total liabilities [if any portion of the cost estimates for response activities (lines 1 or 2) is included in total liabilities, you may deduct that amount from this line and add that amount to lines 5 and 6].	$$$$$$$$$
*5.	Tangible net worth.	$$$$$$$$$
*6.	Net worth.	$$$$$$$$$
*7.	Current assets.	$$$$$$$$$
*8.	Current liabilities.	$$$$$$$$$
9.	Net working capital [line 7 minus line 8].	$$$$$$$$$
*10.	The sum of net income plus depreciation, depletion and amortization.	$$$$$$$$$

*11.	Total assets in the United States.	$$$$$$$$$
*12.	Total assets in Michigan, excluding the value of all real property on which response activities are necessary. $$$$$$$$$	
*13.	Total assets in Michigan, including the value of all real property on which response activities are necessary.	$$$$$$$$$

		YES	NO
14.	Is line 5 at least $10 million?	___	___
15.	Is line 5 at least 6 times line 3?	___	___
16.	Is line 9 at least 6 times line 3?	___	___
*17.	Are at least 90% of the company's assets located in the United States?	___	___
18.	Is line 11 at least six times line 3?	___	___
19.	Is line 4 divided by line 6 less than 2.0?	___	___
20.	Is line 10 divided by line 4 greater than 0.1?	___	___
21.	Is line 7 divided by line 8 greater than 1.5?	___	___
*22.	Is line 12 at least $50 million?	___	___
23.	Is line 13 at least 6 times line 1?	___	___

To "pass" alternative I of the standard financial test, the company must meet two out of three of the ratios listed in lines 19, 20, and 21, and must meet the criteria listed in lines 14; 15; 16; 17 or 18; and 22 and 23.

ALTERNATIVE II

1. Sum of the current cost estimates for response activities needed at Michigan facilities, including the costs for operation and maintenance of remedial actions for the next thirty year time period.	$$$$$$$$$
2. Sum of the current cost estimates for response activities needed at non-Michigan facilities, including the costs for operation and maintenance of remedial actions.	$$$$$$$$$
3. Sum of lines 1 and 2.	$$$$$$$$$
4. Current bond rating of most recent issuance of this company and name of rating service.	XXXXXXX
5. Date of issuance of bond.	XXXXXXX
6. Date of maturity of bond.	XXXXXXX
*7. Tangible net worth (if any portion of the cost estimates for response activities (lines 1 and 2) is included in "total liabilities" on your financial statements, you may add that portion to this line).	$$$$$$$$$
*8. Total assets in the United States.	$$$$$$$$$
*9. Total assets in Michigan, excluding the value of all real property on which response activities are necessary.	$$$$$$$$$
*10. Total assets in Michigan, including the value of all real property on which response activities are necessary.	$$$$$$$$$

	YES	NO
11. Is line 7 at least $10 million?	___	___
12. Is line 7 at least 6 times line 3?	___	___
*13. Are at least 90% of company's assets located in the U.S.?	___	___
14. Is line 8 at least 6 times line 3?	___	___
*15. Is line 9 at least $50 million?	___	___
16. Is line 10 at least 6 times line 1?	___	___

To "pass" alternative II of the standard financial test, the company must have a current rating for the most recent bond issuance of AAA, AA, A, or BBB for Standard and Poor's or Aaa, Aa, A, or Baa for Moody's, and must meet the criteria listed in lines 11; 12; 13 or 14; and 15 and 16.

[Insert the following at the end of the SFT that you choose to use]

I hereby certify that the wording of this form is a true copy of the model financial test provided by the Michigan Department of Environmental Quality, with the exception of changes made and agreed to by representatives of the MDEQ and **[name of company]**.

_____
Chief Financial Officer

_____
Name of Company

Date: _____

Signed and sealed
in the presence of:

_____
NOTARY PUBLIC

Notary Public _____ County
My Commission Expires _____

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
ENVIRONMENTAL RESPONSE DIVISION

Guidance document
Financial Assurance Mechanisms: The Financial Test
Appendix B

LETTER FROM CHIEF FINANCIAL OFFICER FOR FINANCIAL TEST

Alan Howard, Chief
Environmental Response Division
Michigan Department of Environmental Quality
Knapp's Centre
300 South Washington Square
P.O. Box 30426
Lansing, MI 48909-7973

Dear Mr. Howard:

I am the chief financial officer of **[name of company]**, **[address]**.

This letter is in support of **[name of company]**'s use of the financial test to demonstrate financial assurance, pursuant to the terms and conditions of the Administrative Order by Consent between **[name of company]** and the State of Michigan.

The **[name of company]** is the **[owner/operator]** of the **[name of facility]** located at **[address of facility]**. The location of this facility is further described in the property description provided in Attachment __ to the **[Agreement/Order/Decree]**. Financial assurance is required by the MDEQ to assure the performance of the necessary and appropriate response activities at the facility in accordance with Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, Act 451 of the Public Acts of 1994, as amended (NREPA), and the requirements of the **[Agreement/Order/Decree]**.

This company has prepared Standard Financial Test-Alternative **[I/II]** (SFT) using the MDEQ model SFT and has passed that test as shown in the attached SFT document. The estimated annual costs of work to be performed at this facility as reflected in the SFT is $_____.

With this letter, I also am submitting the following items to demonstrate to the MDEQ that **[name of company]** meets the requirements for using the **[financial test]** as its financial assurance mechanism:

- A copy of **[name of company]**'s most recent year-end Annual Report; and
- A Report of the Independent Certified Public Accountant, which certifies his/her review of this letter and this company's financial statements. **[Note: the model letter to be used for this report is provided in Appendix C of this guidance document.]**

This company **[is/is not]** required to file Form 10K with the Securities and Exchange Commission (SEC) for the latest completed fiscal year which ended **[date]**.

I hereby certify that the wording of this letter is identical to the model letter provided by the MDEQ, with the exception of changes made and agreed to by representatives of the MDEQ and **[name of company]**.

_____
Chief Financial Officer

_____
[Name of Company]

Date: _____

Signed and sealed
in the presence of:

_____
NOTARY PUBLIC

Notary public _____ County
My commission expires _____

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
ENVIRONMENTAL RESPONSE DIVISION

Guidance Document
Financial Assurance Mechanisms: The Financial Test
Appendix C

FINANCIAL TEST REPORT OF THE INDEPENDENT CERTIFIED PUBLIC ACCOUNTANT

[Name of Chief Financial Officer]
[name and address of Corporation]:

Dear **[name]**:

The **[name of accounting firm]** has audited, in accordance with generally accepted auditing standards, the financial statements of **[name of company]** for its fiscal year ending **[date]** and has issued its report thereon dated **[date]** (except for the matter described in _____ as to which the date is **[date]**.)

We have not performed any auditing procedures since that date.

At your request, I have read your letter to the Michigan Department of Environmental Quality dated _____, **[year]**, and have compared the data therein, which are specified as having been derived from the **[name of company]**'s audited financial statements for its fiscal year ending _____, **[year]**, to the **[name of company]**'s financial statements for its most recent fiscal year. In connection with that review, no matters came to my attention that caused me to believe that the specified data should be adjusted or corrected.

This report is furnished solely for the use of **[name of company]** and the Michigan Department of Environmental Quality and is not to be used for any other purpose.

_____
[Name of Accountant]

_____
[Name and address of Accounting Firm]